



Phase I & II Geo-Environmental Assessment

181 Havant Road
Hayling Island
PO11 0LG

Prepared for:

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181 HAVANT ROAD, HAYLING ISLAND

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a combined Phase I Desk Study & Phase II Intrusive Investigation undertaken to determine ground conditions, establish if there are any environmental risks associated with the site and its development and provide a geotechnical appraisal. Pertinent findings and conclusions may be summarised as follows:

The site comprises an existing active petrol filling station (PFS). It is located along the junction on Havant Road and Victoria Road, Hayling Island approximately 7.5km west of Portsmouth. Currently onsite there is an associated kiosk, Greggs outlet, parking and areas of soft landscaping. Much of the northern and western parts of the wider property were heavily overgrown and inaccessible.

The proposed development consists of the demolition of existing structures onsite and construction of a new petrol filling station, store, multiple EV charging bays and more parking spaces.

Intrusive investigations involved the drilling of four boreholes to a maximum depth of 6.0m. Shallow soils were found to comprise of made ground that have a maximum thickness of 1.0m, overlying peat which was found in two locations. Beneath this was found to be River Terrace Deposits overlying very silty chalk. Groundwater was found between 1.5m to 2.0m below ground level (bgl).

Shallow soil samples were tested for the presence of potential contamination and no significant risk to users of the site have been established. Groundwater samples showed there are some contaminants above screening criteria for groundwater, but they are not considered to represent an unacceptable risk in the context of the redevelopment works that will involve the upgrade of fuel infrastructure. Waste analysis has indicated that on the basis of the current data, all shallow made ground materials is classified as **NON-HAZARDOUS** and the shallow superficial clays can be classed as **INERT** for the purposes of offsite disposal.

Ground gas monitoring was not commissioned as part of these works and it has not been possible to dismiss risks from a neighbouring landfill to the south as a result. In the absence of gas monitoring data, it has been necessary to recommend precautionary ground gas protection in all new buildings. Monitoring may remove this requirement and EPS can advise further if required. It is recommended that the Local Authority is consulted on this approach.

ENGINEERING SUMMARY

The ground conditions across site may not be suitable for conventional spread foundations due to localised areas of soft clays and considerable thickness of peat and therefore deeper piled foundation may be a more suitable solution for this site.

Consideration should be taken in the detailed design of the substructure as the groundwater was found to be shallow between 1.0m to 2.0m depth below the surface.

At the current time, a design CBR value of only 1% can be recommended for the site, although it is strongly recommended that some more detailed in-situ CBR testing is undertaken to confirm CBR values, as it may be possible to increase this.

A Design Sulphate Class (DS) of DS-1 with an aggressive chemical environment for concrete (ACEC) of AC-1 is considered suitable for shallow buried concrete.

The above points represent a simplified summary of the findings of this assessment and **must not** form the basis for key decisions for the proposed development. A thorough review of the details is contained within the following report, or alternatively get in touch and we'll talk you through it.



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Where ground investigations have been conducted, these have been limited to the level of detail required for the site in order to achieve the objectives of the investigation.

The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework 2019 requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.

As stated within DEFRA's Contaminated Land Statutory Guidance (2012), with any complex risk assessment it is possible that different suitably qualified people may reach slightly different conclusions when interpreting the same information. EPS recognises this and considers the conclusions presented within this report to be robust and appropriate but input from the Local Authority and their judgement in line with this guidance would still be welcomed.

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1 INTRODUCTION

In November 2022, EPS (Leeds) Ltd (EPS) was commissioned by Euro Garages to complete a Phase I & II Geo-Environmental Desk Study on land at 181 Havant Road, Hayling Island, PO11 0LG ('the site'); see Figure 1.

The proposed development is understood to comprise the demolition of existing structures onsite and the construction of a new Petrol Filling Station (PFS) with a larger store and associated drive-thru. A new substation and multiple EV charging bays will also be installed, along with new parking spaces and landscaping.

This report presents the findings, conclusions, and recommendations of the Phase I Desk Study and subsequent Phase II Intrusive Investigation undertaken as instructed.

1.1 Objectives

The objectives of this investigation were as follows:

- a) Compile a Phase I Desk Study and Conceptual Site Model through a Preliminary Risk Assessment to evaluate the potential risks the site may pose to human and environmental receptors, both currently and in future.
- b) Investigate potential contaminant linkages identified in the CSM by means of investigating shallow soils and groundwater.
- c) Determine the potential risks posed by the site and make recommendations for further work that may be required, to ensure safe development in accordance the Environment Agency's *Land Contamination: Risk Management* guidance (LC:RM, 2020) and the *National Planning Policy Framework*.
- d) Collect information on ground conditions and strength in order to make appropriate recommendations for geotechnical design.
- e) Recover a number of samples for Waste Analysis, including Waste Acceptance Criteria (WAC) to support soil disposal.

1.2 Scope of Work

To perform an exploratory assessment of the site in accordance with the principles and requirements of DEFRA's 'Contaminated Land Statutory Guidance' (2012), BS10175 – 'Investigation of Potentially Contaminated Sites', BS 5930:2015+A1:2020 'Code of practice for ground investigations' and BS EN 1997 'Geotechnical Design', the following tasks were undertaken:

Desk Study:

Collection of site records.

Study of existing geological, hydrogeological and historic maps of the area.

Consultation of environmental databases, including records held by the local authority (where available).

Review of proposed development plans.

Development of a Conceptual Site Model (CSM) through a Preliminary Risk Assessment.

Intrusive Investigation:

Site walkover, inspection of any visual evidence of contamination at the site, obtaining photographic records.

Health and safety briefing / site supervision.

Drilling of four window sample boreholes to a maximum depth of 6.0m below ground level (bgl) using a track-mounted percussive rig.

Continual logging of ground conditions including inspection of samples for visual and olfactory contamination, and laboratory analysis of selected representative samples.

Installation of gas and groundwater monitoring standpipes at selected locations.

Collection of groundwater samples using the 'low-flow' method and subsequent laboratory analysis.

Reporting:

Data collection

Interpretation of data including completion of Generic Quantitative Risk Assessment

The findings and conclusions of these investigations are presented in the following sections.

1.3 Limitations and Constraints

The purpose of this report is to present the findings of a soil sampling investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, EPS makes the following statements:

No investigation method is capable of completely identifying all ground conditions that might be present in the soil or groundwater under a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes and / or trial pits to recover soil and / or groundwater samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface however, ground conditions are naturally variable and it may be possible that the conditions encountered may differ to those found during the investigation.

No visible evidence of Japanese Knotweed was identified during the site walkover. However, this plant can be difficult to identify in the early stages of growth and therefore it is not always possible to identify its' presence at certain times of the year. For this reason, EPS cannot confirm that Japanese Knotweed rhizomes do not exist and it is recommended that if it is suspected that this species, or other similarly invasive plants are present at the site, a specialist contractor should be commissioned to make a detailed assessment.

The investigation was carried out to assess the significance of contamination resulting from the use of the site as identified in this report. Unless EPS has otherwise indicated, no assessment of potential impact of any other previous uses has been made.

2 SITE CONTEXT

The following section provides a summary of the information collected in relation to the site location and history.

2.1 Site & Location Description

Detail	Description
Location	The site lies to the west of Havant Road, in the north west of Hayling Island, close to the west coast of the island and approximately 3.5km north of its urban centre.
National Grid Reference	471770, 103020
Topographic Elevation	Topographic surveys show that the area of the existing PFS lies at around 2.50m Above Ordnance Datum (AOD), while land in the north-western area of the property rise to up to 3.85m AOD.
Description of Site	The site is currently an active PFS situated to the west of and accessed via Havant Road (A3023). It consists of a PFS with associated canopy and signage with a kiosk operated by SPAR supermarkets, a jet wash area and a separate restaurant structure operated by Greggs to the west of forecourt. The PFS area is a mixture of block paving and concrete hardstanding with additional areas for parking. There are several areas of soft landscaping in the south, east and north with the tank refuelling infrastructure and tank farm located in the southwest of the PFS area. Land to the southwest, west and north of the PFS is densely vegetated and large areas could not be accessed during the site visit. A small area of former parking comprising made ground is located immediately to the south of the PFS area.
Surrounding Land Use	The surrounding land consists of residential housing to the north and south with agricultural fields in the wider surrounding area. The west coast of Hayling Island is within 50m west of site with a beach and the sea beyond. A former railway, which is now called the 'Hayling Billy Trail' is located to the west of the property boundary.

A plan showing the site location is provided as Figure 1, the current site layout is detailed on Figure 2, an aerial photograph is included as Figure 3 and a borehole location plan is presented in Figure 4. Selected site photographs are included as Appendix A, a proposed development plan is included as Appendix B and relevant extracts of a Landmark Envirocheck report are included as Appendices C to F.

2.2 Geo-Environmental Setting

Detail	Description	
Geology	Geological maps record superficial Raised Marine Deposits (sand and gravel) and River Terrace Deposits (sand silt and clay). An area of Beach and Tidal Deposits is recorded to the west (clay, silt, sand, gravel with occasional peat). Bedrock geology is recorded as the Lewes Nodular Chalk Formation.	
	Historical borehole records were consulted which identified approximately 0.6m of topsoil overlying 2.5m of chalk. Beneath this was a flinty chalk to termination depth of 4.57m. Groundwater was encountered at 1.14m beneath surface. A large area of Made Ground is recorded in land to the west, which is understood to have been a former landfill and is discussed further in below sections. Information on the site's geological context and a copy of the historical borehole is included as Appendix D.	
British Geological Survey (BGS)	A single recorded mineral site is present within a 1km search radius, 790m north, extracting common clay and shale at the Creek Common Clay Pit. Operation has since ceased.	
Geological Hazards	Hazard	On Site Risk
	Mining (non -coal)	No Hazard
	Collapsible Ground	Low/ Very Low (No Hazard @ 6m W)
	Compressible Ground	Very Low (Moderate @ 6m W)
	Ground Dissolution	Very Low (No Hazard @ 6m W)
	Running Sand	Low (Moderate @ 6m W)
	Landslide	Very Low
	Shrinking/ Swelling Clay	Low
	Soluble Rock Risk	Significant Risk – Problems Unlikely
Radon	The Envirocheck indicates the site to lie in a location where the percentage of homes above the radon action level is between 1% to 3%, but indicates that radon protection measures will not be required in the construction of new buildings or extensions.	
Hydrogeology	Groundwater vulnerability maps for the area show that the underlying superficial geological units are classified as a Secondary Aquifer - A and Secondary Aquifer - Undifferentiated. The bedrock is defined as a principal aquifer. The site does not lie within a Source Protection Zone for local groundwater abstraction.	
	No groundwater abstractions are recorded within 1km. Groundwater vulnerability maps are included as Appendix E.	
Hydrology	There are significant surface water features within the surrounding area with an inland river / drain recorded in the north west corner. This feature was not observed during the EPS works as the area was densely vegetated.	

Detail	Description
	Additional inland rivers are found within 100m of site in multiple directions. A large tidal channel is located within 100m west of site. This flows into the English Channel, approximately 4km south of site. The Envirocheck report lists no discharge consents or surface water abstraction within 500m. Review of the EA Flood Zone Map for the area indicates that the site lies entirely within Flood Zone 3, which is defined as the area at risk of extreme flooding from fluvial or tidal sources. It should be noted that the EA maps do not take into account the presence of flood defences or flooding from poor drainage, or groundwater. A copy of the flood map for the site and surrounding area is also included within Appendix E.
Landfill & Waste	The Envirocheck report records a historic landfill site approximately 20m west, recorded to be Creek Point Road and disposing of household waste. This site has been closed since December 1965. Two instances of infilled land are recorded within 1km, the nearest of these being 290m north of site.
Licensed Industrial Activity	The ESSO PFS onsite operates under local Authority Pollution Prevention and Controls.

2.3 Industrial Land Use & Pollution

The Envirocheck report lists 19 industrial land uses within 1km, the most pertinent of which are summarised below.

Land Use	Approximate Distance (Direction)	Status
ESSO (Petrol Filling Station)	On-Site	Active
Filtafry (Filtration System & Services)	105m (NE)	Inactive
Island Blinds (Blind, Awnings & Canopies)	215m (S)	Inactive
S C A Group Ltd (Scaffolding & Work Platforms)	360m (SE)	Inactive
Carrie's Cleaners (Cleaning Services)	360m (N)	Inactive

One incident of Substantiated Pollution Incident Register is recorded 324m south east of site. This relates to a Category 2 –Significant Incident in September 2018 relating to crude sewage.

2.4 Sensitive Land Use

The site lies within Hayling Billy nature reserve and also a Nitrate Vulnerable Zone where eutrophic water is identified as being at risk. West Hayling nature reserve is located 10m west of the site. Chichester and Langstone Harbours SSSI, RAMSAR, Special Areas of Conservation and Special Protection Areas site is located 10m west of site. The Chichester Harbour Areas of Outstanding Natural Beauty is located 805m north of site.

2.5 Site History

A summary of historical map data from 1870 to 2021 is summarised below. Key points are highlighted, and copies of relevant historic maps and any others examined during the investigation are included in this report as Appendix F.



Earliest mapping shows the site to be undeveloped until a petrol filling station was constructed in approximately 1980. Earliest maps show the North Hayling Station to the south west of site and Stoke Windmill to the south east.

The majority of the residential properties in the surrounding area were first built in the 1930s, with development ongoing up to the 1990s.

The areas to the north west of site varied between mudflats, tidal ponds and some commercial oyster bed. This area remains tidal flats, now protected by a nature reserve. A landfill/refuse heap was recorded on land to the west of the railway for part of the mid 1900s.

2.6 Site History

As part of this work, EPS contacted the local petroleum officer at Hampshire Trading Standards in order to gather further information on the existing fuel infrastructure and a response was received on 14th December 2022, which is summarised below.

There are records of five tanks on the site

- o Tank 1 –17,270 litres –Super Unleaded Petrol
- o Tank 2 –17,270 litres –Unleaded
- o Tank 3 –35,540 litres –Diesel
- o Tank 4 –34, 540 litres –Unleaded
- o Tank 5 –21, 590 litres –Supreme Diesel

The Petroleum Officer indicated that there have been no records of leaks or spills.

There are no tank or line testing results on file.

All tanks are single skin steel and were installed in 1983.

All petroleum officer information has been included in Appendix G.

3 PRELIMINARY RISK ASSESSMENT & CONCEPTUAL SITE MODEL

In accordance with the Environment Agency's Land Contamination: Risk Management, there are three stages to managing contaminated land (Risk Assessment/Remedial Options Appraisal/ Remediation and Verification). This section outlines the first tier of Stage 1, the Preliminary Risk Assessment.

The following section provides a review of the contaminant linkages that may be active at the site, whereby EPS have examined the potential sources that may be present as a result of historic and / or current site activities and where potential interaction between these sources and the identified human / environmental receptors may occur.

3.1 Background

A Desk Study comprises the first stage of any geo-environmental assessment, the purpose of which is to determine what potentially contaminative activities may have occurred at the property or the surrounding area which may pose an environmental or geological risk to site users, the surrounding environment or proposed development, either at present or in the future.

The method used in this investigation to assess the environmental risk posed is based on the concept of 'contaminant linkage', which considers the following three factors:

Source	The location from which an environmentally hazardous / co substance is, (or was,) derived.
Pathway	A route or mechanism via which a source could come into contact with a receptor to cause significant harm.
Receptor	An environmentally sensitive object or condition e.g. person controlled water, or ecological system, which may be present now or in future.

If all three factors are identified, there is the potential for a 'contaminant linkage' to be active, which could result in significant harm being caused to the environment or human health.

3.2 Source Characterisation

The following potential contaminant sources have been identified at the site and in the surrounding area:

Potential Source	Source Description	Principal Contaminants of Concern
Current Site Use	Petrol Filling Station	TPH, BTEX, MTBE
Current and Historic Surrounding Land Use	Unknown material (made ground) used to levels areas under significant hardstanding onsite	ACM, Metals, PAH
	Presence of a garage to the north of site with assumed fuel storage	TPH, PAH, BTEX, MTBE
	Historic orchards to the north east and east of site	Metals, Pesticides, Herbicides

Potential Source	Source Description	Principal Contaminants of Concern
	Historic landfill to the west.	Ground Gas (CO ₂ , CH ₄)

Notes

PAH	Polycyclic Aromatic Hydrocarbons	ACM	Asbestos Containing Material
TPH	Total Petroleum Hydrocarbons	MTBE	Methyl Tert Butyl Ether
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	CO ₂	Carbon dioxide
CH ₄	Methane		

3.3 Potential Receptors

A framework for the assessment of risks arising from the presence of contamination in soils has been produced by the Environment Agency and the Department for the Environment, Food and Rural Affairs (DEFRA) and is presented with the report: '*Using Science to Create A Better Place: Updated Technical Background to the CLEA Model – Science Report SC050021/SR3*'. This guidance document defines a series of standard land-uses which have been further developed into six generic land uses in the Category 4 Screening Levels project for Land Affected by Contamination (DEFRA/Contaminated Land: Applications in Real Environments (CL:AIRE) Project Report SP1010, 2014) which form a basis for the development of the Conceptual Site Model.

Risks posed to controlled waters have been considered in line with the Environment Agency's *approach to groundwater protection* (v1.2, 2018) and associated position statements.

The proposed development plan comprises the demolition of existing structures onsite and the construction of a larger store with either separate or attached drive-thru restaurant. This proposed land use has been considered as

Commercial

In view of the environmental setting, current and potential future land use of the site and surrounding sites, the potential receptors for any contaminant impact are discussed in the table below:

Receptor	Site Specific Description
Human	Future site users, site workers involved in the site redevelopment, and those working and living in the surrounding area have the potential to be at risk from exposure to potential contaminants of concern (CoCs).
Groundwater	The site is underlain by superficial Secondary Aquifer undifferentiated, with the bedrock geology being a Principal Aquifer. As such, groundwater is considered to be a sensitive receptor.
Surface Water	A number of surface watercourses are present within the surrounding area including a drain that is recorded in the north west of site. A tidal river leading to the English Channel persists within 100m to the west. It is plausible that site derived contamination may enter these watercourses and therefore surface water is considered a highly sensitive receptor onsite.
Flora and Fauna	The proposed development includes the provision of marginal areas or soft landscaping. Some of the identified contaminants of concern are known to be phytotoxic and as such, the potential for this impact should be considered however this impact would be low and will be limited to the small verge areas.

Receptor	Site Specific Description
Buildings & Infrastructure	Subsurface structures are likely to be present at the site which may be adversely affected by the potential presence of the identified contaminants of concern. These include concrete used in building foundations, buried potable water supply pipes and other service lines and pipes.
Adjacent Land	The surrounding land use is predominantly residential and therefore neighbouring land users should be considered as sensitive receptors. In addition, a number of nature reserves are present in the surrounding area, which should also be considered.

3.4 Potential Pathways

Where contaminants may be present in soil, there are a number of potential pathways that enable human receptors to come into contact with or be exposed to them. The most direct pathways, considered under current UK legislation, can be summarised as follows:

Direct ingestion of contaminated soil	Dermal contact with household dust
Ingestion of household dust	Inhalation of fugitive soil dust
Ingestion of contaminated vegetables	Inhalation of fugitive household dust
Ingestion of soil attached to vegetables	Inhalation of vapours outside
Dermal contact with contaminated soil	Inhalation of vapours inside

Clearly, not all of these potential pathways apply for every standard land-use. For example, ingestion of contaminated vegetables will not apply to land uses other than residential with plant uptake and allotments.

However, in addition to direct exposure pathways, a number of physical transport mechanisms / pathways may also exist at a site that allow remote or less accessible contaminants in soil or groundwater to reach human or environmental receptors both at a site and beyond the site boundary. These include the transport mechanisms listed below.

Downward and lateral movement of contaminants in soil either by gravity or through being 'leached' by percolating rainwater	Direct seepage or leaching of contaminants from soil into subsurface drains or supply pipework.
Lateral migration of contaminants dissolved in groundwater.	Volatilisation of contaminants from groundwater or unsaturated soils into buildings or outdoor air.

Through examination of the standard land use and environmental setting at each site, the presence of pathways and transport mechanisms described above must be considered when assessing whether a contaminant linkage may plausibly be active, and therefore be included in the conceptual site model.

3.5 Summary of Contaminant Linkages

Considering the site use and environmental setting, and proposed land use, the following plausible contaminant linkages have been identified through this phase I assessment and require further investigation.

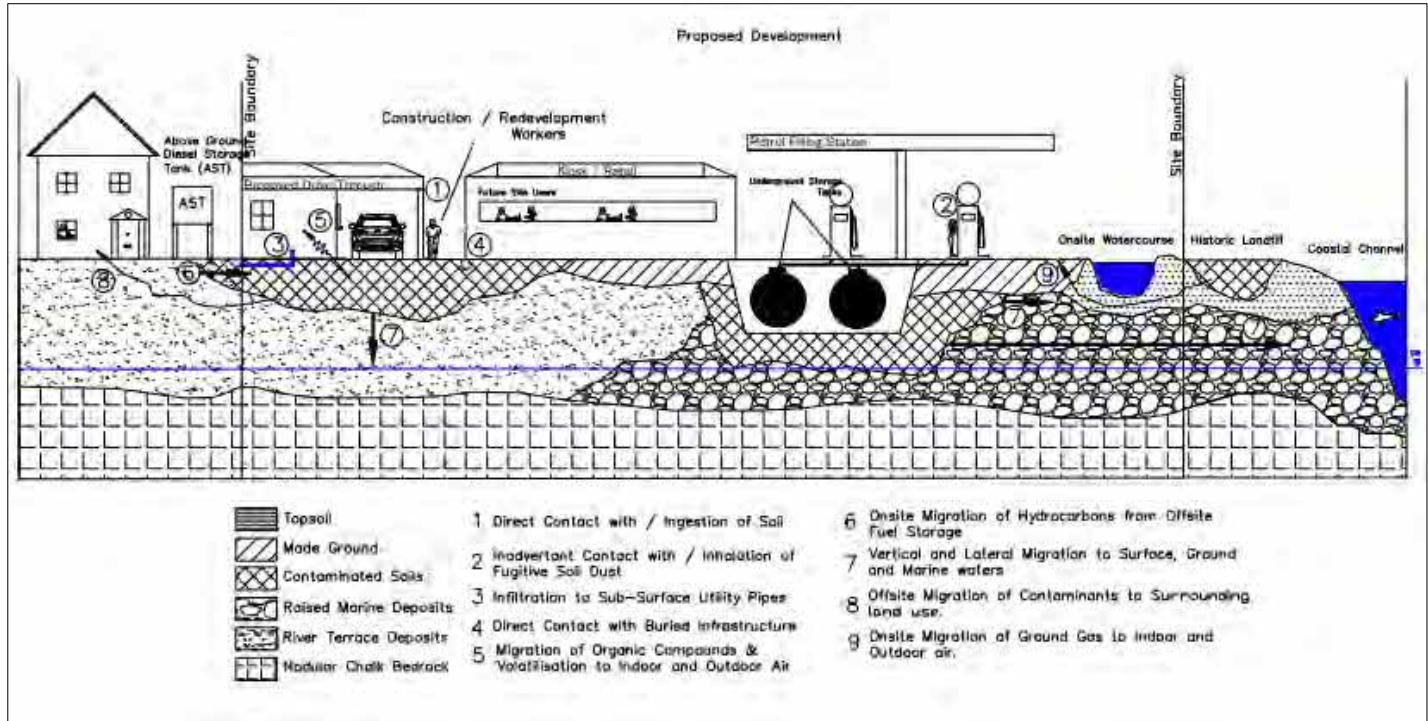
Source	Pathway	Receptor
Contaminated soil (Made Ground/ Infilled Material)	Direct contact and inadvertent ingestion by eating or smoking with dirty hands & inhalation of fugitive dusts	Construction workers during redevelopment & Site Users
Contaminated soil (Hydrocarbon Contamination)	Vertical migration of contaminants through unsaturated soils to groundwater	Groundwater
	Direct contact	Buried infrastructure
	Lateral migration of contaminants in soils and shallow groundwater to surface waters	Surface waters (including marine waters)
	Volatilisation of organic compounds to indoor air	Site users
	Ingress / diffusion through permeable potable water supply pipes	
Landfill	Migration of Ground gas into indoor air	Site users

The following comments are made with respect to contaminant linkages which have been considered through development of the conceptual model, but have not been concluded as 'plausible' –i.e. through which a significant possibility of significant harm could occur to an identified receptor:

Though identified as a possible source of contamination, the historic orchards to the north and east of site are not considered to pose a viable risk to site. Their distance from site coupled with the fact that the associated contaminants of concern are known to have low mobility within the environment mean it is highly unlikely the site will be impacted.

The following diagram provides an illustration of the plausible contaminant linkages that may be active at the site and which may need further investigation or control to ensure safe development:

Illustrative Conceptual Site Model –181 Havant Road, Hayling Island



3.6 Key Potential Areas of Concern and Uncertainties

The main area of concern is possible hydrocarbon contamination within soils beneath site, relating to historical and current site use as a petrol filling station, in addition to a garage mapped to have existed immediately north of site. The primary risk is the water resources in the area with an onsite surface watercourse, principal bedrock aquifer and nearby coastal waters. Future site works and redevelopment works are also considered at risk from contaminated soils and made ground, via direct contact, possible ingress of contamination to utilities and volatilisation into indoor and outdoor air.

4 SUMMARY OF INTRUSIVE INVESTIGATIONS

Intrusive ground investigations were undertaken on 21st December 2023 in accordance with EPS standard operating procedures, copies of which will be made available on request. A summary of all site activities is presented in the following sections:

4.1 Exploratory Hole Locations

Exploratory hole locations were selected through consideration of the potential contaminant linkages identified through the Phase I Desk Study, the proposed development layout, the location of below ground utilities as well as operational and health & safety considerations.

Four window sample boreholes (WS01 –WS04) were formed at the site to a maximum depth of 6.0m using a track-mounted percussive drilling rig.

The overall objective in terms of exploratory hole locations was to provide an appropriate lateral and vertical coverage of the soils underlying the site in order to offer information relating to their quality and nature as well as provide information for geotechnical design.

Standpipes were installed in within all positions (WS01 –WS04) on a precautionary basis. Groundwater sampling pipes were installed using 50mm diameter HDPE well casing and fitted with a gas tap. Slotted casing (1mm slot) was installed at each location from the base of the borehole to approximately 1.0m below the surface. The installations were completed to ground surface using plain casing. A filter pack of 2-3mm of washed gravel extended from the base of the boreholes to approximately 0.1m above the slotted section with a bentonite seal to surface. All installations were finished with flush-mounted, bolt-down headworks.

A window sample borehole location plan is presented as Figure 4.

4.2 In-Situ Testing & Soil Sampling

Each window sample borehole was logged for ground conditions encountered and inspected for any physical evidence of contamination, such as soil staining, odour and the presence of separate phase liquids on a precautionary basis. Window sample borehole logs are presented in Appendix H.

Standard or cone penetration tests (SPT / CPT) were carried out in all materials using an automatic trip hammer. The number of blows required to advance a standard split spoon, (or solid 60° nose cone for the CPT test) over the final 300mm of a 450mm total drive was recorded, and is shown on the borehole records at the penetration resistance (“N” value).

Where potentially volatile organic compounds are suspected, EPS carries a Photoionisation Detector (PID), which can be used to measure the relative concentrations of vapour associated with soil samples collected from different depths and locations at the site. In these circumstances, soil samples will be placed into plastic bags, sealed, shaken and then allowed to rest for a few minutes to allow time for volatile vapour to accumulate in the air trapped within the bag. The PID probe will then be used to pierce the bag and sample the air above the soil to measure the concentration of volatile compounds that have accumulated. PID readings are only used to provide EPS with a basic means to quantify areas of volatile organic compound in the field to help guide the investigation. As potentially volatile organic compounds, specifically including petroleum hydrocarbons, were identified in the conceptual site model, PID readings were collected during this intrusive

investigation. These readings are included within window sample borehole logs presented as Appendix H and the results are discussed further in later sections.

4.3 Laboratory Testing

Samples obtained for analysis of identified contaminants of concern were submitted to Derwentside Environmental Testing Services Limited of County Durham, who hold appropriate UKAS / MCERT accreditation for the required testing. Samples were transported in laboratory supplied containers and delivered to the laboratory by approved courier.

Geotechnical testing was undertaken by The Testing Lab, Doncaster, a UKAS accredited laboratory. Copies of chain of custody documentation are held by EPS and will be made available on request.

A laboratory testing schedule is included as Table 1.

5 FINDINGS OF THE INVESTIGATION

This section of the report provides a summary of the findings of the various aspects of the ground investigation.

5.1 Ground Conditions

A total of four window sample boreholes were formed at the site and the ground conditions encountered, from surface level, were found to comprise:

- Topsoil
- Made Ground
- Beach and Tidal Flat Deposits
- River Terrace Deposits
- Lewes Nodular Chalk Formation

Site specific window sample borehole logs are included as Appendix H and give descriptions and depths of strata encountered. A summary of the general strata encountered across the site is provided in the table below, with more detailed description given in the following sub sections.

Geological Strata	Maximum Depth to Base of Strata (m bgl)	Strata Thickness (m)
Topsoil	0.20	0.20
Made Ground	1.0	0.35-0.80
Beach and Tidal Flat Deposits	2.20	0.20 - 1.20
River Terrace Deposits	4.50	1.50 –3.50
Lewes Nodular Chalk Formation	>6.0 (not proven)	>0.8->2.5 (not proven)

5.1.1 Topsoil

Topsoil was only encountered within WS01 and WS02 in areas of soft landscaping. This material was logged as a soft dark brown silty sandy clay overlain by grass in both locations.

5.1.2 Made Ground

Made ground was recorded within all locations and was typically variable in composition, particularly the granular content. In general, made ground was a firm brown silty sandy slightly gravelly clay with occasional fragments of concrete. Rare timber fragments were recorded in WS04.

5.1.3 Beach and Tidal Flat Deposits

A layer of peat was found within locations WS03 and WS04 which was described as dark grey clayey silty peat with occasional rootlets and organic material. In WS03, which was the western most location, the peat was present between 1.0m to 2.20m and underlain by soft clayey gravelly silt, also considered to be representative of Beach and Tidal Flat Deposits. In WS04, a soft fibrous peat was present between 0.50m-0.70m and underlain by a soft to very soft sandy slightly gravelly clay, considered to be representative of Beach and Tidal Flat Deposits.

5.1.4 River Terrace Deposits

Soils considered representative of River Terrace Deposits were encountered in all locations with a thickness ranging from 1.50m - 3.50m and was observed as a light brown silty slightly sandy slightly gravelly clay. Gravels are of fine chalk and medium to coarse flint fragments.

5.1.5 Lewes Nodular Chalk Formation

Bedrock of the Lewes Nodular Chalk Formation was encountered at all drilling locations and logged as extremely weak, white structureless chalk, containing roughly 20% intact chalk and flint gravel.

5.2 Groundwater

Groundwater strikes were encountered within the River Terrace Deposits in all window sampling locations (WS01 - WS04) at depths between 1.50m and 2.0m.

5.3 Physical Evidence of Contamination

Despite the presence of a limited thickness of made ground, there was no palpable evidence of contamination, waste or putrefiable material encountered in any of the sampling locations during the investigation including any visual or olfactory evidence of hydrocarbon staining.

Headspace testing was undertaken at regular intervals during the field works which identified concentrations of organic vapours above instrument detection levels within WS01 at 4.85m depth, with a peak reading of 92.40ppm v/v. No associated staining or odour was noted in these soils.

5.4 Laboratory Analysis –Soil

A laboratory analysis testing schedule is presented as Table 1 and all environmental sample results obtained from the laboratory are included as Appendix I. The key results of laboratory testing on environmental soil samples are summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/ kg)		Highest Location & Depth (m bgl)
			Min	Max	
Arsenic	5	5	0.7	11	WS01 (0.40 –0.80)
Cadmium	5	5	0.2	0.5	WS01 (4.50 –5.00) WS02 (0.00 –0.20)
Chromium III	5	5	1.3	21	WS04 (0.70 –1.00)
Chromium VI	5	0	-	-	-
Copper	5	5	2.4	27	WS02 (0.00 –0.20)
Lead	5	5	4.0	58	WS02 (0.00 –0.20)
Mercury	5	1	0.05		WS02 (0.00 –0.20)
Nickel	5	5	1.8	17	WS04 (0.70 –1.00)
Selenium	5	1	0.7		WS01 (4.50 –5.00)
Zinc	5	5	11	79	WS02 (0.00 –0.20)
Naphthalene	2	0	-		-
Benzo[a]pyrene	2	1	0.08		WS04 (0.70 –1.00)
Dibenz(ah)anthracene	3	0	-		-
Phenols	3	0	-		-
BTEX	3	0	-		-
Aliphatics C21 –C35	5	4	5.68	9.09	WS02 (0.00 –0.20)
Aromatics C16 –C21	5	1	3.08		WS02 (0.00 –0.20)
Asbestos (%)	5	0	-		-

Notes

-
BTEX

Contaminant not found above laboratory detection limits
 Benzene, Toluene, Ethylbenzene, Xylenes

PAH

Polycyclic Aromatic Hydrocarbons

5.5 Laboratory Analysis –Groundwater

The key results of laboratory testing on environmental groundwater samples are summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (ug/ l)		Highest Location
			Min	Max	
Aliphatics C8 – C10	4	3	19	34	W S04
Aliphatics C10 – C12	4	2	8.8	16	W S04
Aliphatics C12 – C16	4	2	11	26	W S01
Aromatics C8 – C10	4	2	27	51	W S04
Aromatics C12 – C16	4	1	34		W S01
Aromatics C16 – C21	4	1	42		W S01
Benzene, Toluene, Ethylbenzene	4	0	-		-
Xylene	4	3	6.3	16	W S04
VOCs	1	0	-		-

Notes - Contaminant not found above laboratory detection limits
VOC Volatile Organic Compound

5.6 Waste Analysis

Waste classification (i.e. hazardous or non-hazardous) was undertaken on samples of both made ground and natural soils, which included total concentrations of metals and hydrocarbons, using computer software provided by HazWaste Online™. The results of the WAC analysis are included within Appendix I and the outputs from the software are included in a Waste Classification Report in Appendix J.

Waste Acceptance Criteria was subsequently undertaken on one sample of topsoil/ made ground and one sample of natural soils. These results, together with those of the waste classification above are summarised in the following table:

Strata	Typical Depth (m bgl) and Description	Is it Hazardous? (number of hazardous samples)	Waste Acceptance Criteria	Appropriate Landfill
Made Ground	0.0-1.0 - Dark brown silty sandy gravelly clay with gravels of flint, chert, chalk and charcoal fragments.	No (0 of 3)	Fails Criteria for Inert Landfill	NON-HAZARDOUS
River Terrace Deposits	1.0-4.0 - light brown very silty sandy gravelly clay. Gravels of chalk and flint.	No (0 of 1)	Passed Criteria for inert landfill	INERT

Based on the above made ground should be classified as **NON-HAZARDOUS** for the purposes of off-site disposal, under the waste code **17 05 04**. The one sample of made ground submitted for WAC analysis failed criteria for inert landfill due to the concentration of Total Organic Carbon (TOC).

River Terrace Deposits were found to pass criteria for **INERT** landfill disposal.

Chalk samples were not submitted for WAC, so should be considered **NON-HAZARDOUS** for off-site disposal.

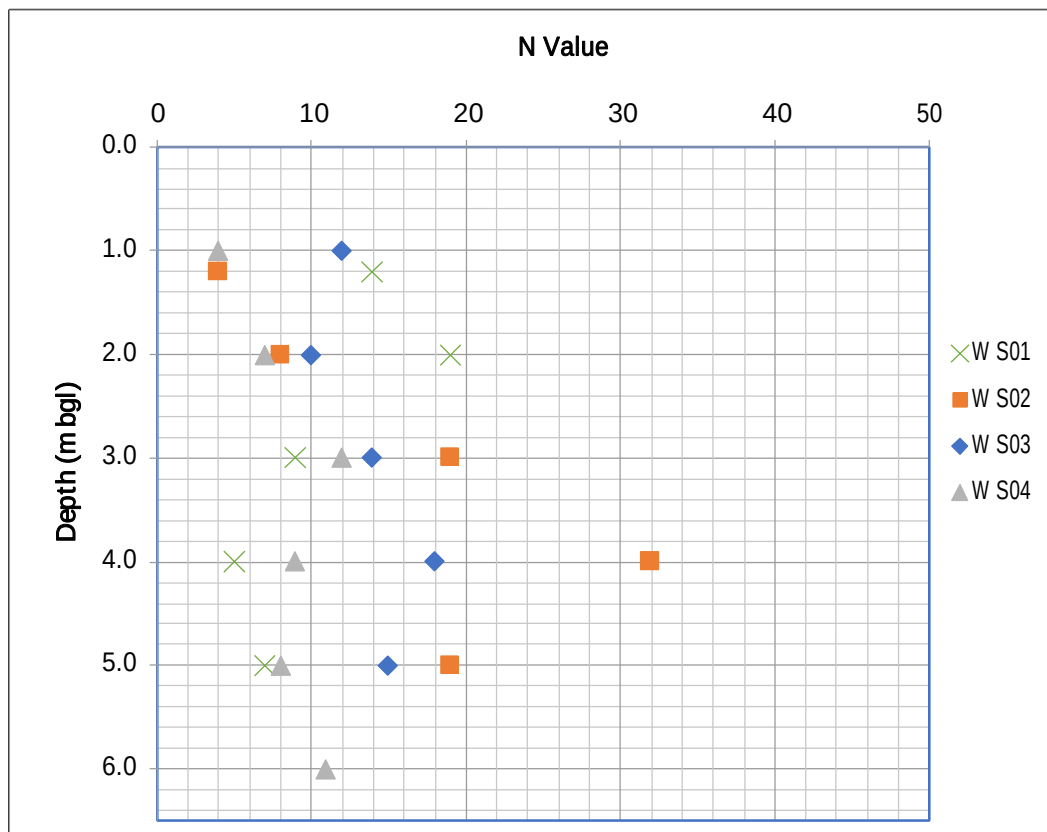
It should be noted that the final decision on waste acceptance criteria will lie with the chosen waste receiver.

For made ground present on a brownfield site such as this, although the soil sampling process did not identify potentially hazardous concentrations of Asbestos Containing Material (ACM) within the soil, it must be acknowledged that the material may exist within areas which were not sampled or accessible during the investigation. Any visually identifiable fragments of ACM can invalidate any non-hazardous waste classification, as such, the above waste classifications are made on the proviso that any visually identifiable fragments of ACM are removed from the material prior to its disposal off-site. The subsequent ACM must then be disposed of in accordance with the Control of Asbestos Regulations 2012.

5.7 Geotechnical Testing

5.7.1 *In-Situ Geotechnical Testing*

The results of in-situ geotechnical testing, as applicable to the chalk bedrock are summarised in the graph below.



5.7.2 Laboratory Geotechnical Testing

The results of geotechnical laboratory testing are summarised in the table below and all geotechnical sample results obtained from the laboratory are included as Appendix K. The key results of laboratory testing on geotechnical soil samples are summarised below.

Strata	Range of Parameters			
	Moisture Content (%)		Plasticity Index (%)	
	Min	Max	Min	Max
River Terrace Deposits	14	26	7 (5.32)	14
Lewes Nodular Chalk Formation	23		6	

(*)Indicates NHBC Modified Plasticity Index)

Moisture contents and Atterberg Limit was established for seven samples of clay and one sample chalk in accordance with BS1377: 1990.

California Bearing Ratio (CBR) analysis was undertaken on two samples of clay, in accordance with BS1377 : Part 4 : 1990, Clause 7.

Sulphate contents and pH values determinations were carried out by the analytical laboratory, the results of which are included in Appendix I and summarised in section 6.6.

A laboratory analysis testing schedule is presented as Table 1.

6 GEOTECHNICAL APPRAISAL

The ground conditions have been found to comprise of made ground underlain by superficial River Terrace Deposits and Beach and Tidal Flat Deposits overlying bedrock of the Lewes Nodular Chalk Formation. The development is understood to comprise the demolition of existing structures onsite and the construction of a larger store with either separate or attached drive-thru, development of multiple EV charging bays and more parking spaces.

6.1 Geotechnical Category

Geotechnical Category (BS EN 1997-1:2004)	Definition
GC1	Geotechnical Category 1 (GC1) should only include small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations with negligible risk in terms of overall stability or ground movements and in ground conditions which are known.
GC2	Geotechnical Category 2 (GC2) should include conventional structure and foundation with no exceptional risk or difficult or loading conditions. Designs for structures in Geotechnical Category 2 should normally include quantitative geotechnical data and analysis.
GC3	Geotechnical Category 3 (GC3) should include structures or structures, which fall outside the limits of Geotechnical Categories 1 and 2. This may include very large or unusual structures, structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions, or structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

The proposed development is understood to comprise the demolition of existing structures onsite and the construction of a larger store with either separate or attached drive-thru, development of multiple EV charging bays and more parking spaces, and therefore the below assessment has been undertaken in accordance with Geotechnical Category 2 (GC2), including conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions, as defined by BS EN 1997-1:2004.

6.2 Structural Foundations

When considering foundation solutions, it is important to note the variability of the ground conditions, alongside the presence of low strength clays as well as highly compressible layers of organic material (peat) and also very shallow groundwater, which has been recorded as shallow as 1.0m (WS04).

6.2.1 Spread Foundations

Whilst the ground conditions are considered plausible for the use of conventional spread foundations, either strip footings or pad foundations bearing on the underlying River Terrace Deposits, it must be noted that areas comprising considerable thicknesses of peat (Beach & Tidal Flat Deposits), soft clays (WS02) as well as shallow groundwater were recorded which will lead to deep, and challenging excavation conditions in some areas (WS03), particularly as the Beach & Tidal Flat Deposits are not considered to be a suitable bearing strata. On this basis, the use of spread foundations is considered unlikely to be appropriate at this site.

6.2.2 Piled Foundations

Due to localised areas of Tidal Flat Deposits and low strength River Terrace Deposits, a piled foundation solution may be a more suitable foundation solution. If piles are to be adopted for any new structures, they will likely terminate in the Lewes Nodular Chalk Formation which has been proven to 6.0m, albeit the depth of this unit is unknown.

Piles will and carry their loads in a combination of end bearing and skin friction. It would be unwise to assume any positive contribution to skin friction within the made ground.

In view of the wide variety of piles sizes available, and the range of installation plant and techniques, the design of the piles should be carried out by and should remain the responsibility of the specialist piling contractor, who will reflect their own methods, experience and design procedures within their proposals.

A deep borehole is likely to be required for pile design and given the presence of made ground, with limited contamination, a piling works risk assessment may also be required.

6.3 Ground Floor Construction

Given that made ground is present across the site to depths of greater than 0.6m and the near surface soils being likely to be susceptible to volume change, suspended ground floor slabs are recommended for the site, incorporating a sub-floor void suitable for a medium volume change potential soil.

6.4 Pavement Design

Two samples of shallow soils were submitted for California Bearing Ratio (CBR) analysis, returning consistently low values between 0.33% and 0.67%.

Based on the above, a maximum design CBR value of only 1% can be recommended for the site, although it is strongly recommended that more detailed in-situ CBR testing is undertaken to confirm design CBR values.

Where CBR values are lower than 2% it is typically the case that some form of permanent improvement of the subgrade is required, through perhaps the use of geo-grids or lime/cement stabilisation.

6.5 Groundworks

Whilst excavations in the natural cohesive soils may remain stable for short periods during construction the long-term stability of these and any excavations in made or disturbed ground should not be relied upon in unsupported excavations. Particular attention will need to be given to excavations made for underground tanks as it is inevitable that these will be below groundwater level and subject to instability.

Heavy plant and stockpiles of materials should not be permitted close to the edges of unsupported excavations. Further reference may be made to CIRIA Report No. 97 'Trenching Practice' 1992.

On the basis of the findings of the ground investigation, significant quantities of groundwater are likely to be encountered within shallow excavations for foundations or drainage and are likely to require some form of semi-permanent groundwater control during construction.

It should be noted that very low CBR values have been recorded for the natural soils at the site, suggesting the near surface soils are of low strength and therefore the trafficability of exposed soils may be limited and consideration should be given to the use of temporary surfacings.

6.6 Drainage

Infiltration drainage is not considered suitable at this property due to the shallow depth of groundwater, particularly in WS02, where resting level during groundwater monitoring was only 0.75m, as well as the presence of cohesive and organic soils.

6.7 Concrete Grade

Sulphate contents and pH values determinations were carried out for the natural material by the analytical laboratory, the results of which are also included within Appendix I. Results for concrete grade are summarised within the following table:

Strata	Water Soluble Sulphate (mg/l SO ₄)		pH	
	Min	Max	Min	Max
River terrace Deposits	18		8.2	
Lewes Nodular Chalk Formation	16	8.5	8.5	

In accordance with Part 1 of the BRE Special Digest 1 'Concrete in Aggressive Ground' 2005, the mean of the highest two water soluble sulphate values has been used. This gives a Design Sulphate Class (DS) of DS-1 with an aggressive chemical environment for concrete (ACEC) of AC-1.

7 ENVIRONMENTAL APPRAISAL

The following section outlines the approach applied to assessing the risks posed to human health and controlled waters, then identifies any sample results found by this investigation which warrant further consideration. In accordance with the Environment Agency's Land Contamination: Risk Management, this section represents the second tier of Stage 1, the Generic Quantitative Risk Assessment.

7.1 Human Health

7.1.1 Land Use Setting

It is understood that development proposals for the site includes the demolition of existing structures and construction of a larger shop and an attached or separate drive-thru, the existing areas of soft landscaping will be maintained or reduced as a result. In order to screen laboratory data for concentrations of contaminants in soil with potential to cause harm to human health in these soft landscaped areas, relevant generic screening values most applicable to this land use have been utilised. A land use setting of Commercial has been adopted as it is considered the most representative.

The technical framework used to derive DEFRA's Category 4 Screening Levels (Policy Companion Document '*SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination*') outlines the relevant factors for determining land use selection in the application of the screening levels and the following key considerations have been taken into account.

7.1.2 Generic Screening–Soils

The technical framework used to derive the assessment criteria and the documents in which they are published are summarised as follows:

EA Science Reports (SC050021/SR2, SC050021/SR3, and SC050021/SR7)

EA Soil Guideline Value Science Reports

Suitable For Use Levels (S4ULs) for Human Health Risk Assessment –LQM and CIEH (2015)

Soil Generic Assessment Criteria for Human Health Risk Assessment - EIC/AGS/CL:AIRE (2010)

Category 4 Screening Levels (C4SLs) provide generic suitable for use screening values for common contaminants in a variety of land uses and are also utilised as appropriate generic screening criteria.

Where assessment of the risk to human health from asbestos in soil is concerned there is no nationally recognised suitable for use /generic screening value commonly referred to through the planning system. Due to this, it is necessary to take a more qualitative approach to the risks posed to future site users from asbestos on a site-specific basis.

7.1.3 Generic Screening–Groundwater

The technical framework used to derive the assessment criteria and the documents in which they are published are summarised as follows:

EA Science Reports (SC050021/SR2, SC050021/SR3, and SC050021/SR7)

EA Soil Guideline Value Science Reports

Suitable For Use Levels (S4ULs) for Human Health Risk Assessment –LQM and CIEH (2015)

Soil Generic Assessment Criteria for Human Health Risk Assessment - EIC/AGS/CL:AIRE (2010)

The VOCs Handbook. Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination (C682), CIRIA, London 2009

Society of Brownfield Risk Assessment (SoBRA) 'Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater' - Version 1.0, February 2017

SoBRA groundwater vapour GAC were derived for two types of land uses, namely generic residential and generic commercial land use. They are intended as a conservative screening tool in the assessment for long-term (chronic) risks to human health from inhalation of vapours arising from groundwater. For other land uses (public open space, and allotment), these typically do not include building and as such pathway of vapour intrusion is generally not recognised.

A summary of the screening criteria and the methodology used to derive them is included in Appendix L.

7.1.4 Assessment of Results- Human Health

The results of the screening process for on-site human receptors showed that generic screening criteria representative of risks to future site users were not exceeded for any contaminant at any location.

7.2 Controlled Waters

7.2.1 Generic Screening

In addition to screening the recorded concentrations of contaminants to pose risks to human health, EPS has also screened the results of soil analysis for potential to cause harm to water resources.

The criteria used for this process were derived by EPS using the following technical guidance

Environment Agency Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination.

Primary Receptor Associated with Site	Basis of Tier 1 Criteria
Groundwater	UK Drinking Water Standards (UKDWS)
Surface Water	UK Environmental Quality Standards (EQS)

The site is underlain by Principal Aquifer, and as such the primary water resource receptor associated with the site is groundwater. Groundwater screening criteria have been selected in the assessment of risks to water resource receptors.

7.2.2 Assessment of Results- Controlled Waters

The screening process has shown that screening criteria representative of suitability of soil concentrations as applicable to controlled waters have not been exceeded, however, a number of exceedances for groundwater concentrations have been detected, as highlighted in the below table:

Contaminant	Screening Value (ug/l)	Number of Exceedances	Exceedance (ug/l) & Location
Aliphatic C8 –C10	10	3	19 (WSU1) 23 (WS02) 34 (WS04)
Aliphatic C10 –C12	10	2	16 (WSU2) 16 (WS04)
Aliphatic C12 –C16	10	2	26 (WSU1) 11 (WS02)
Aliphatic C16 - C21	10	2	29 (WSU1) 18 (WS02)
Aliphatic C21 - C35	10	1	14 (WS02)
Aromatic C8 –C10	10	3	27 (WSU1) 35 (WS02) 51 (WS04)
Aromatic C12 –C16	10	1	34 (WS01)
Aromatic C16 –C21	10	1	42 (WS01)
Aromatic C21 - C35	10	1	14 (WS01)

The fact some recorded values exceed those of the screening criteria does not necessarily indicate that an unacceptable risk to controlled water exists. The recorded concentrations are only marginal exceedances of screening criteria, which are inherently conservative by nature. The low exceedances and the fact that no free-phase product was observed suggests that the recorded contaminants are indicative of small-scale releases, such as the accumulation of drips and small spills over time, rather than a major release from fuel infrastructure.

The concentrations of contaminants recorded in this investigation do not suggest that an unacceptable risk to controlled waters exists. In addition, the proposed redevelopment will involve the removal of historic infrastructure and replacement with modern equipment, which will reduce the likelihood of infrastructure failure leading to fuel releases to the environment.

7.3 Conclusions and Recommendations

Laboratory analysis of shallow soils sampled across site identified no contaminants of concern at levels that exceeded screening criteria human health and therefore no additional recommendations are considered necessary regarding human health.

Groundwater was encountered at shallow depths between 1.0m and 2.0m from surface level and no physical evidence of hydrocarbons was identified within the field and soil samples. However, laboratory analysis of groundwater indicated that a number of fractions of TPH are present at concentrations above screening criteria protective of groundwater. However, given the relatively minor exceedances and the fact that no evidence of free-phase fuel was observed in samples, the levels of contaminants recorded are not considered to represent an unacceptable risk to controlled waters. In addition, the redevelopment works will involve upgrades to fuel storage and distribution infrastructure, which should reduce the level of risk to groundwater at this site. It is recommended that EPS attend site during the excavation of existing fuel infrastructure to undertake verification testing of the base and sides of excavations, particularly around the tank farm, pumps and lines. Whilst it is not recommended that the existing tanks are kept and re-used, if plans involve re-use and relining of the existing tanks then it is recommended that additional groundwater monitoring is undertaken to further assess the concentrations of hydrocarbons in the groundwater and confirm that gross contamination does not exist. If tanks are to be reused, it would also be recommended that groundwater monitoring is undertaken at the end of the construction phase to confirm that the re-use or relining of tanks was successful and no hydrocarbon releases occurred.

The location of the watercourse (drain) in the northwest should be determined and surveyed prior to development to ensure that fuel infrastructure is not planned to be built in close proximity.

Ground gas monitoring was not commissioned as part of these works and therefore the risks associated with the neighbouring landfill cannot be fully dismissed. Whilst the largely cohesive nature of the underlying geology would indicate that on-site migration is unlikely to occur in sufficient quantities to propose an unacceptable risk, without a suitable dataset it is considered necessary to recommend the installation and formal verification of ground gas protection measures in all buildings on site on a precautionary basis. In accordance with the Modified Card & Wilson approach outlined in CIRIA C665 *Assessing Risks Posed by Hazardous Ground Gases to Buildings*, the site should be treated as Characteristic Situation 2 (CS2). Protection measures should be designed and installed by a suitably qualified contractor and verification should be undertaken independently in accordance with *BS 8485:2015 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. Alternatively, a ground gas monitoring programme could be commissioned to assess the potential for ground gas risk. This approach must be discussed and confirmed with the Local Authority prior to redevelopment. If further works are required to assess ground gas risks then EPS can provide further support.

In the context of potentially unacceptable or acceptable risks as outlined within the Environment Agency's *Land Contamination: Risk Management* guidance (LC:RM, 2020), the risks identified by this work can be addressed through implementation of the following recommendations.

Precautionary measures are also recommended to ensure safe development, as follows:

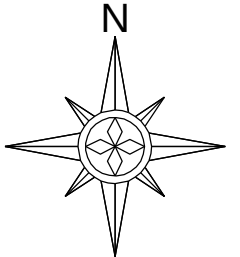
- a) All construction workers operating at the site should be advised of the potential for contact with made ground material within shallow soils, particularly beneath the existing buildings and hardstanding. Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to infilled soils. Reference should be made to relevant health & safety guidance including the following CIRIA document: *R132 Guide to Safe Working on Contaminated Sites*.
- b) Although the findings of the investigation would suggest that significant quantities of asbestos are unlikely to be encountered, the possibility of discrete pockets of this material existing within the made ground remains. If any evidence of visually identifiable ACM is suspected and is to be disturbed during the site development it is recommended that all works are postponed until suitable assessment and control measures (including a Working Method Statement (WMS)) are created. This WMS should be in accordance with guidance from CIRIA as well as the CL:AIRE /Joint Industry Working Group industry guidance on Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials (2016).
- c) Should any palpable evidence of unexpected contamination be encountered during the redevelopment work, it should be reported to EPS so that an inspection can be made and appropriate sampling and assessment work carried out, a method statement for this is provided as Appendix M.

It is recommended that a copy of this report be provided to the Environmental Health Department of Havant Borough Council so that the information may be incorporated into their land quality records and used to support the current planning application. This report should satisfy the pre-commencement requirements of the planning process relating to contamination. A Verification Report will be required documenting the implementation of the remediation prior to completion.

FIGURES



Approx. Site Location



Rev	Date	Drawn	Description	CHKD



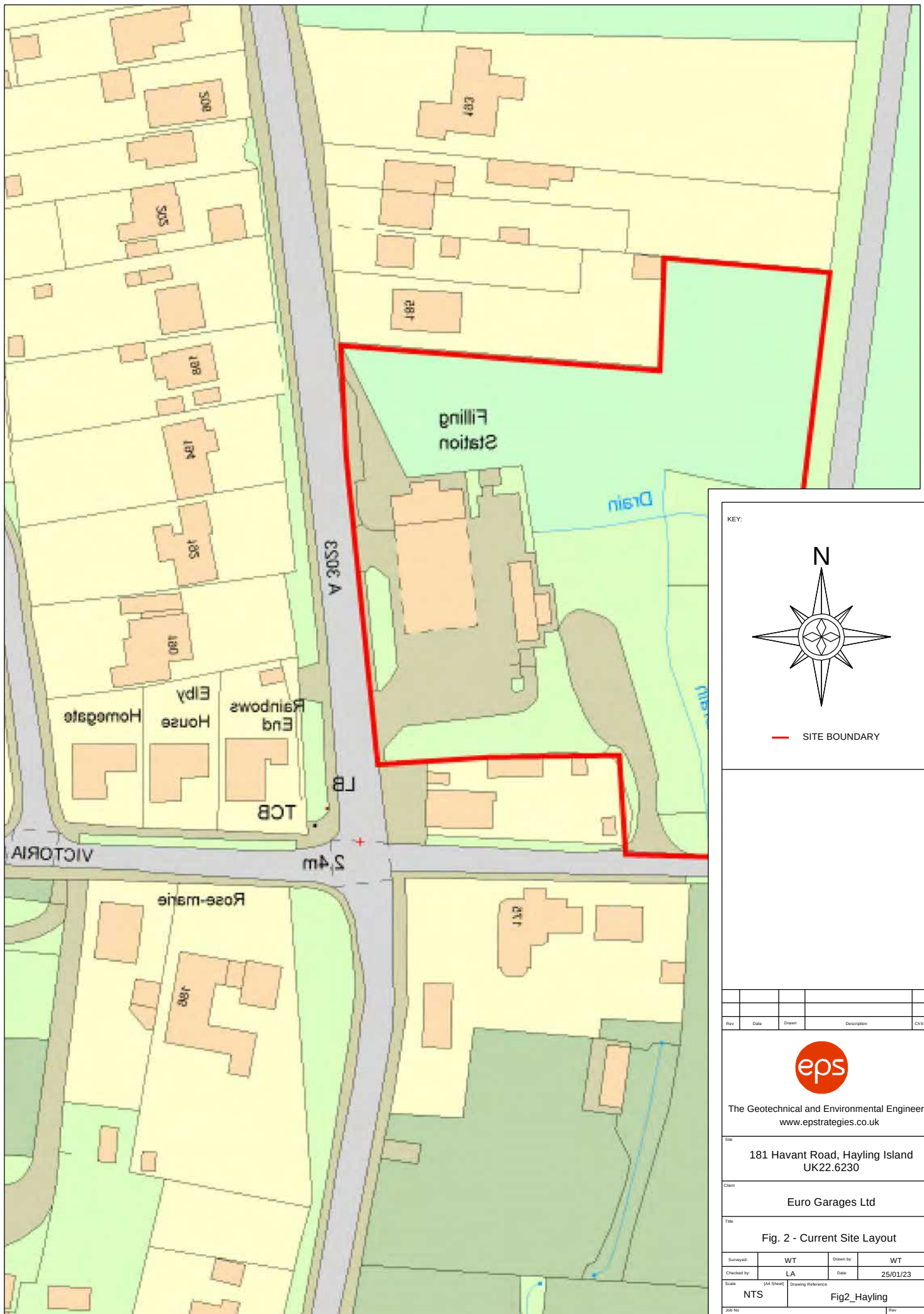
The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

181 Havant Road, Hayling Island
UK22.6230

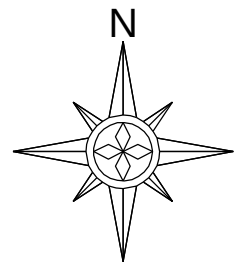
Euro Garages Ltd

Figure 1 - Site Location Plan

Surveyed by	WT	Drawn by	WT
Checked by	LA	Date:	01/12/22
Scale	NTS	Drawing Reference	Fig1_Hayling
Job No	UK22.6230	Rev	01



KEY:



— SITE BOUNDARY

Rev	Date	Drawn	Description	CRN



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Site
181 Havant Road, Hayling Island
UK22.6230

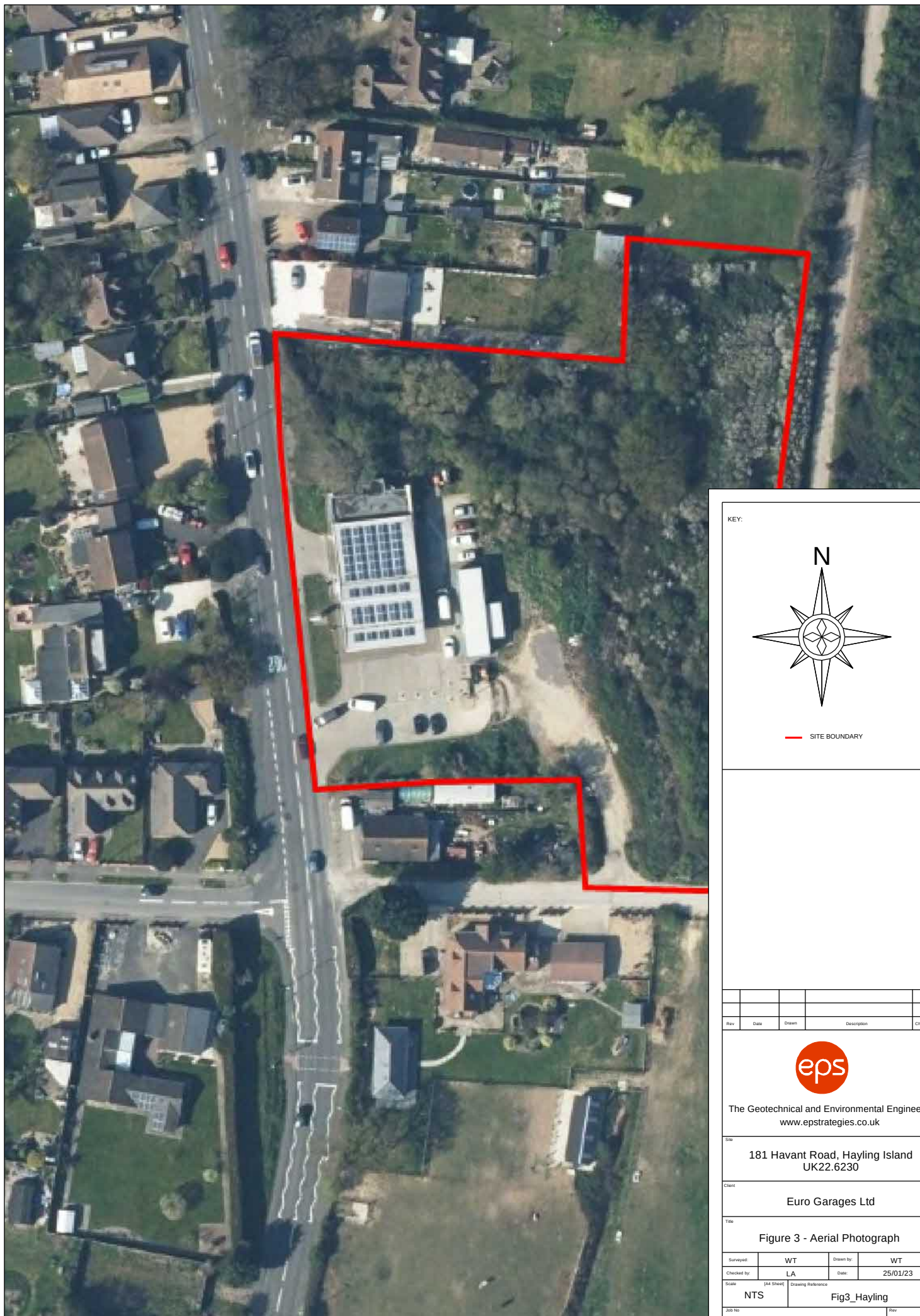
Client
Euro Garages Ltd

Title
Fig. 2 - Current Site Layout

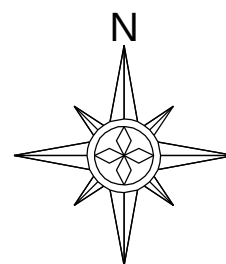
Surveyed by	WT	Drawn by	WT
Checked by	LA	Date:	25/01/23

Scale	NTS	Drawing Reference	Fig2_Hayling
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Job No	UK22.6230	Rev	02
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KEY:



— SITE BOUNDARY

Rev	Date	Drawn	Description	CHKD



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Site
181 Havant Road, Hayling Island
UK22.6230

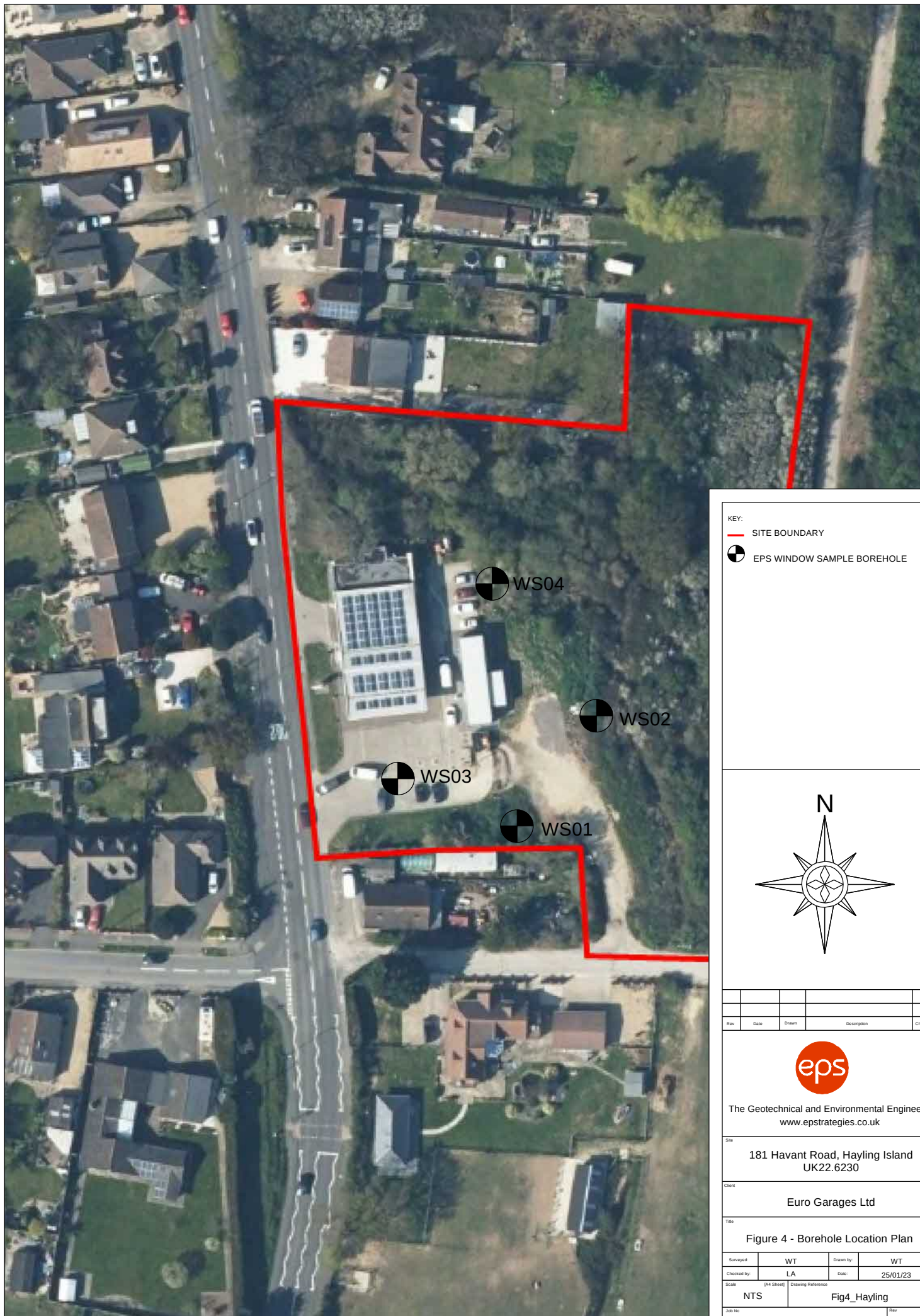
Client
Euro Garages Ltd

Title
Figure 3 - Aerial Photograph

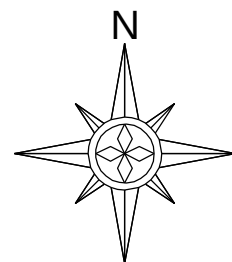
Surveyed by	WT	Drawn by	WT
Checked by	LA	Date:	25/01/23

Scale	(A4 Sheet)	Drawing Reference
NTS		Fig3_Hayling

Job No	UK22.6230	Rev	02
--------	-----------	-----	----



KEY:
— SITE BOUNDARY
● EPS WINDOW SAMPLE BOREHOLE



Rev	Date	Drawn	Description	CHKD



The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
181 Havant Road, Hayling Island
UK22.6230

Client
Euro Garages Ltd

Title
Figure 4 - Borehole Location Plan

Surveyed by:	WT	Drawn by:	WT
Checked by:	LA	Date:	25/01/23

Scale	(A4 Sheet)	Drawing Reference
NTS		Fig4_Hayling

Job No	UK22.6230	Rev	02
--------	-----------	-----	----

TABLES

Table 1 –Laboratory Testing Schedule (Environmental)

Sample ID	Sample Depth (m bgl)	EPS TPH Suite	EPS Waste Suite	EPS Geotech Suite	DETS Spectrum	VOCs
WS01 ES1	0.4 - 0.8	-	X	-	-	-
WS01 ES2	1.5 - 1.8	-	-	-	-	-
WS01 ES3	4.5 – 5.0	-	-	-	X	-
WS02 ES1	0.0 – 0.2	-	-	-	X	-
WS02 ES2	0.6 – 1.0	-	-	-	X	-
WS02 ES3	2.5 - 3.0	-	-	X	-	-
WS03 ES1	0.5 -1.0	-	-	-	-	-
WS03 ES2	2.5 -2.8	-	-	X	-	-
WS03 ES3	4.5 -4.8	-	-	X	-	-
WS04 ES1	0.7 – 1.0	-	X	-	-	-
WS01 GW	Groundwater	X	-	-	-	X
WS02 GW1	Groundwater	X	-	-	-	-
WS03 GW1	Groundwater	X	-	-	-	-
WS04 GW1	Groundwater	X	-	-	-	-
Sample ID	Sample Dep (m bgl)	EPS TPH Suite	EPS Waste Suite	EPS Geotech Suite	DETS Spectrum	VOCs
WS01 ES1	0.4 - 0.8	-	X	-	-	-
WS01 ES2	1.5 - 1.8	-	-	-	-	-
WS01 ES3	4.5 – 5.0	-	-	-	X	-
WS02 ES1	0.0 – 0.2	-	-	-	X	-
WS02 ES2	0.6 – 1.0	-	-	-	X	-
WS02 ES3	2.5 - 3.0	-	-	X	-	-
WS03 ES1	0.5 -1.0	-	-	-	-	-
WS03 ES2	2.5 -2.8	-	-	X	-	-
WS03 ES3	4.5 -4.8	-	-	X	-	-
WS04 ES1	0.7 – 1.0	-	X	-	-	-
WS01 GW	Groundwater	X	-	-	-	X
WS02 GW1	Groundwater	X	-	-	-	-
WS03 GW1	Groundwater	X	-	-	-	-
WS04 GW1	Groundwater	X	-	-	-	-

Notes:

mbgl

1

-

EPS Mini Suite

EPS Waste Suite

meters below ground level

Sample Taken

Sample Not Analysed

Organic Matter, Cyanide, Metals, PAH's, Phenols, Asbestos

Waste Characterisation Suite

Table 2 –Laboratory Testing Schedule (Geotechnical)

Sample ID	Sample Depth (m bgl)	Moisture Content	Liquid / Plastic Limits	California Bearing Ratio
WS01 D1	1.8 - 2.0	X	X	-
WS02 D1	1.6 - 2.0	X	X	-
WS03 D1	2.0 - 2.2	X	X	-
WS03 D2	2.8 - 3.0	X	X	-
WS03 D3	3.8 - 4.0	X	X	-
WS04 D1	4.8 - 5.0	X	X	-
WS04 B1	1.0 - 2.0	X	X	X

Notes:

mbgl

1

-

meters below ground level

Sample Taken

Sample Not Analysed

APPENDICES

APPENDIX A

Selected Site Photographs

Photo 1: Photograph overlooking drilling rig over position WS01.



Photo 2: Photograph showing soils within WS01.



Photo 3: Photograph of PFS forecourt, facing north.



Photo 4: Photograph of soils within WS02.



Photo 5: Photograph of made ground within WS04.

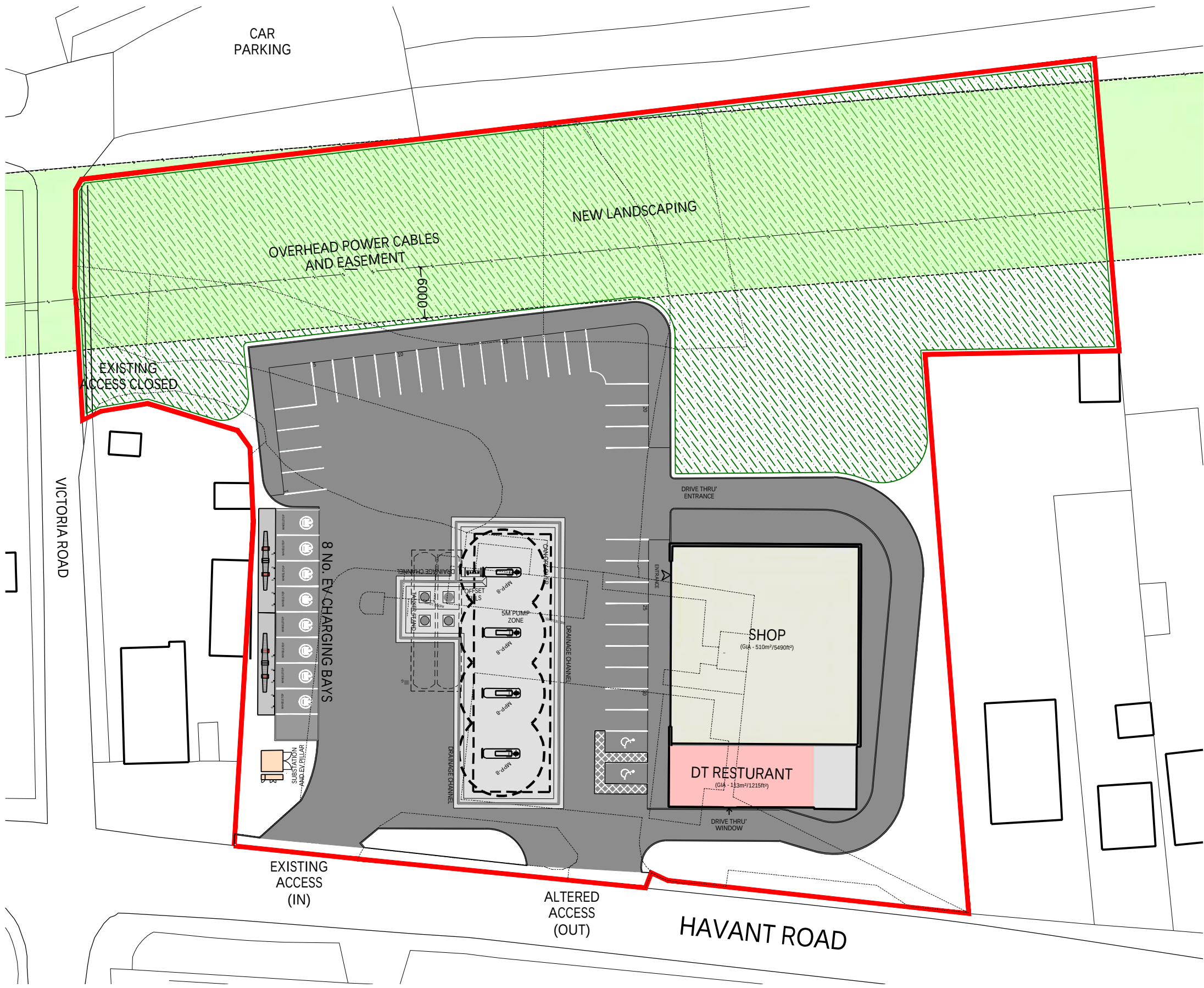


Photo 6: Photograph of white chalk within WS01.



APPENDIX B

Proposed Development Plan



DESIGN RISK ASSESSMENT

As an appointed designer for the project under the Construction (Design & Management) Regulations 2015 - Regulation 8 & Regulation 9, JDL have a duty to consider risk to health & safety relating to the our design & highlight any significant or unusual risks that may not be apparent to a Contractor & Principal Designer. It is assumed that the Client has employed designers & contractors who are competent & have experience working on Petrol Filling Stations

Risks are as follows;

- 1. Overhead power cables and easement
- 2. Coastal line flooding

SCHEDULE OF AREAS	
Application Site	2.1 Acre / 0.85 Hectare
Existing Shop Footprint	102 m² / 1100ft²
Proposed Shop GEA	510m² / 5490ft²
Proposed Parking	33 Bays (2 DDA Bays)
Proposed EV Charging	8 EV Bays

STATUS			Feasibility	
DRAWN BY		GE	ISSUE DATE	NOV 22
PLAN NUMBER		221034-SK2		SCALE
				1:500
				REVISION
				-

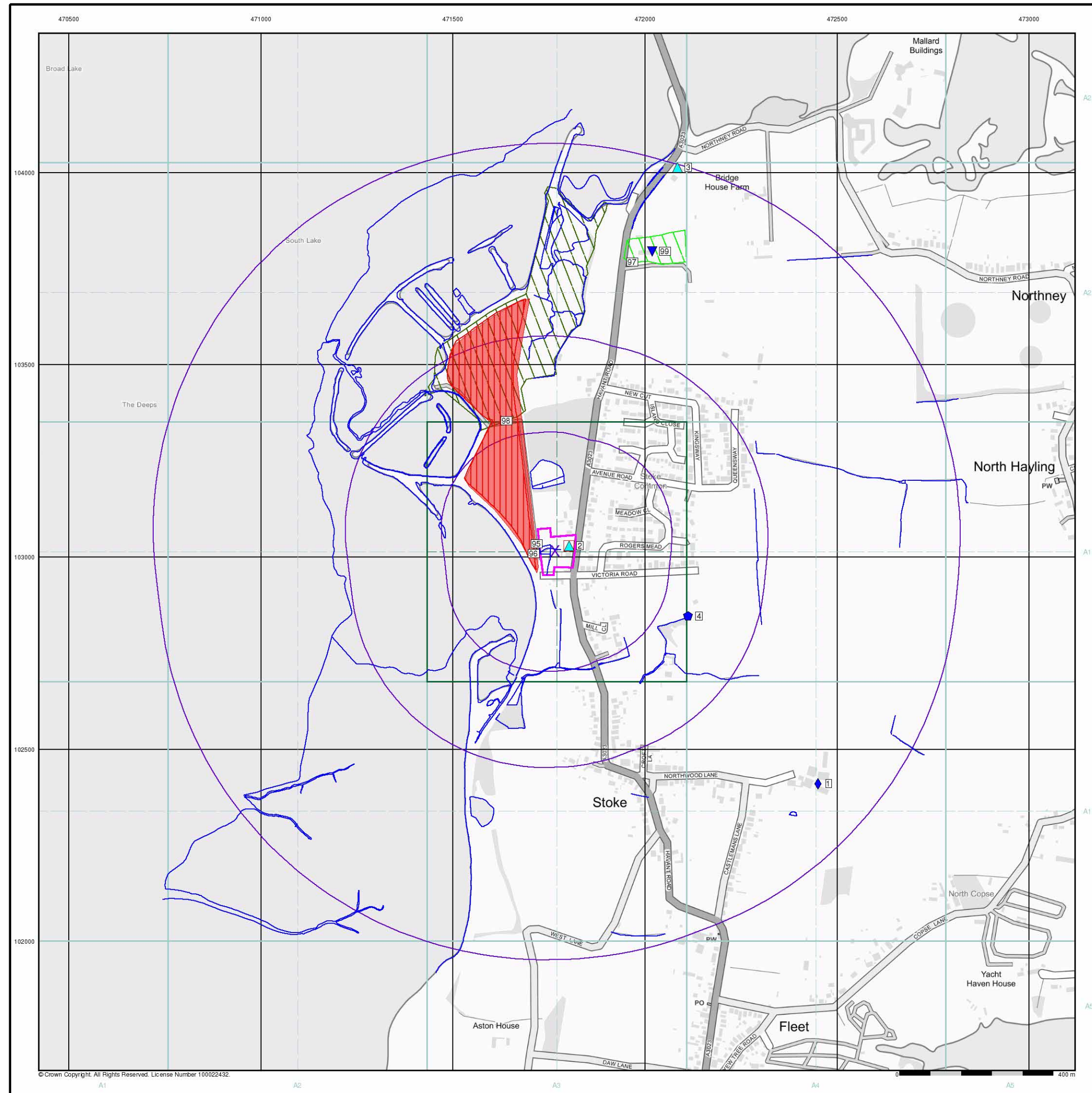
CLIENT		Euro Garages	
ADDRESS		Euro Garages	
		181 Havant Rd	
		Hayling Island, PO11 0LG	



8 Feast Field, Horsforth, Leeds, West Yorkshire, LS18 4TJ
www.jennings-design.com 01274 395422 office@jennings-design.com

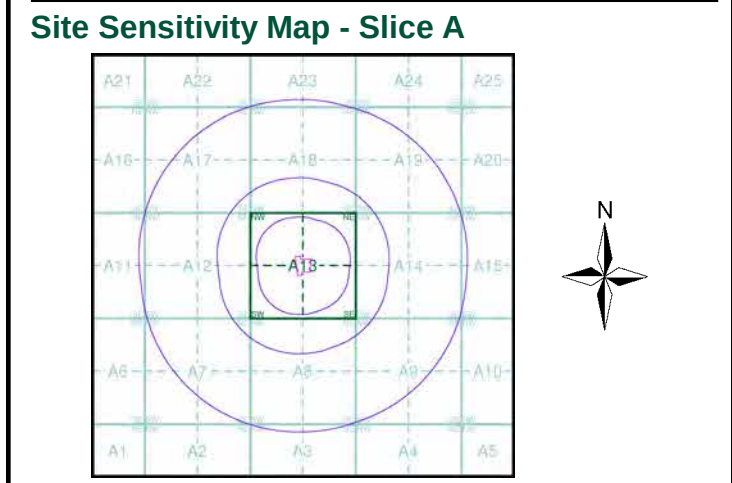
APPENDIX C

Surrounding Land Use



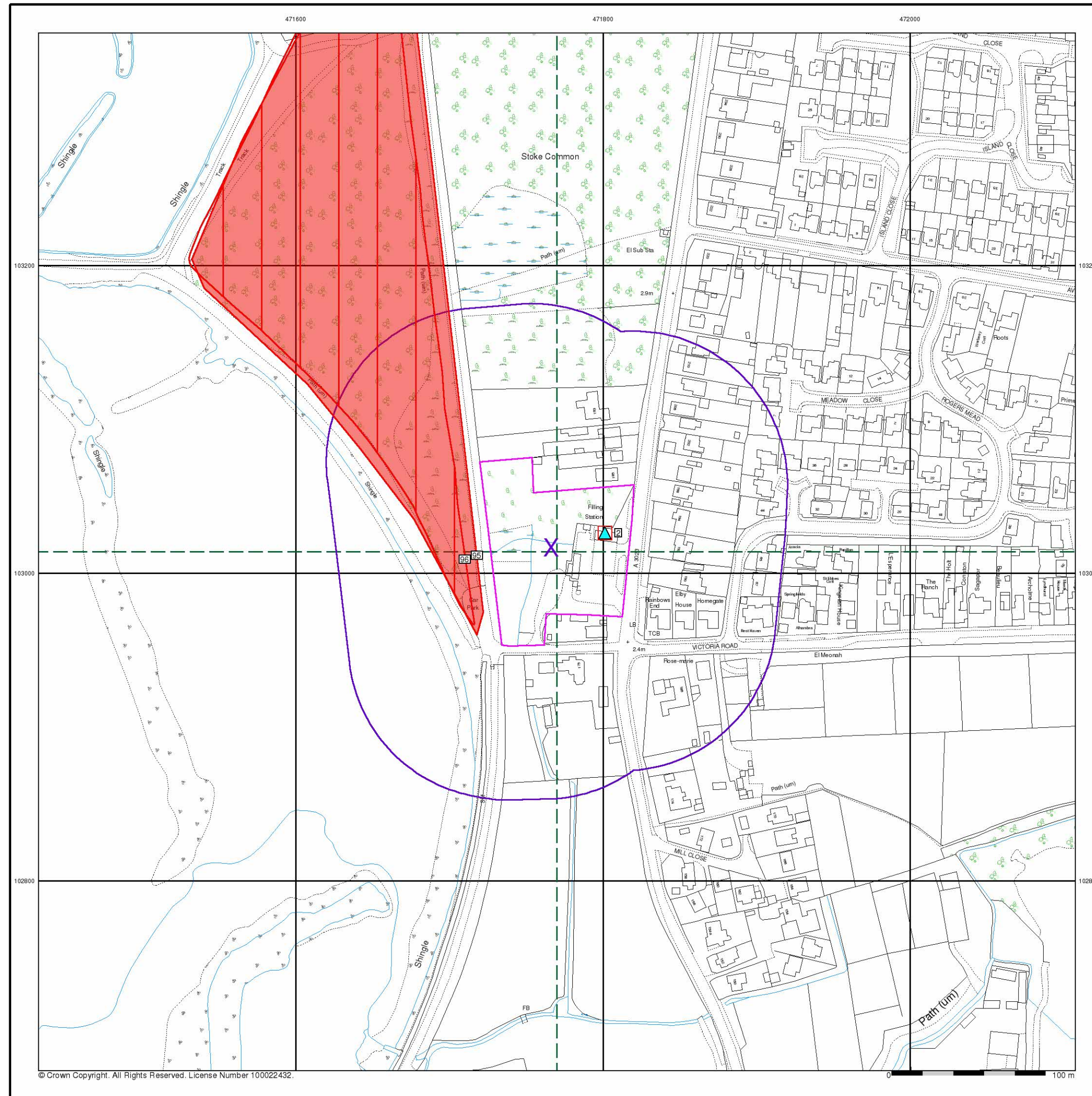
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- General**
 - Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
 - Several of Type at Location
- Agency and Hydrological**
 - Contaminated Land Register Entry or Notice (Location)
 - Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
 - Integrated Pollution Control
 - Integrated Pollution Prevention Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcement
 - Pollution Incident to Controlled Waters
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- Waste**
 - BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Non-water)
 - Potentially Infilled Land (Water)
 - Potentially Infilled Land (Water)
 - Potentially Infilled Land (Water)
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
 - COMAH Site
 - Explosive Site
 - NIHHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- Geological**
 - BGS Recorded Mineral Site



Order Details
Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 1000

Site Details
Hayling island -181 Havant Rd, Hayling Island, PO11 0LG



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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

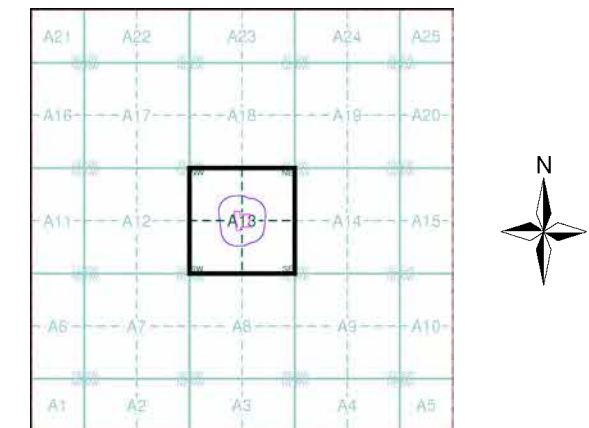
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Segment A13

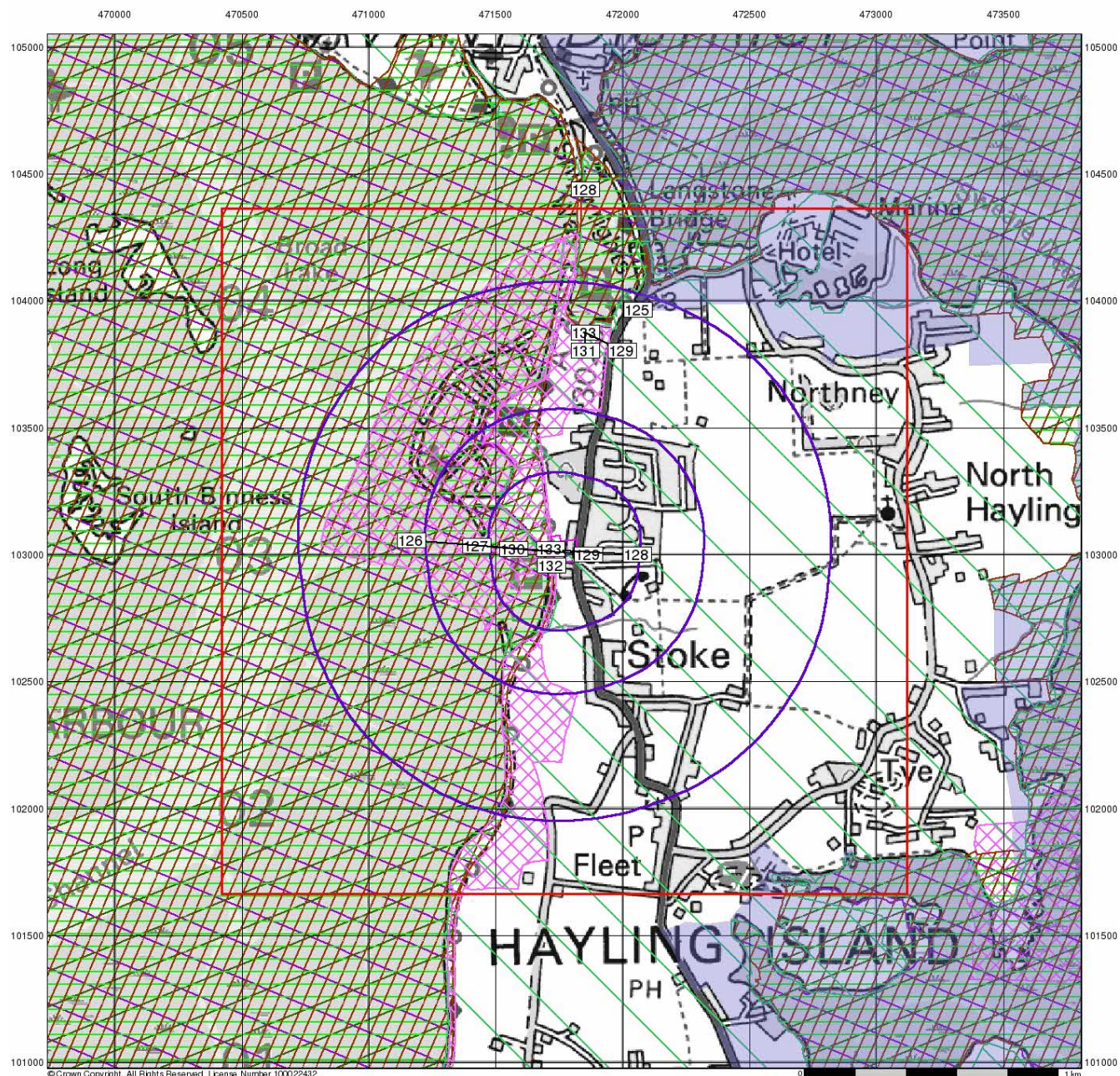


Order Details

Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Plot Buffer (m): 100

Site Details

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Sensitive Land Uses

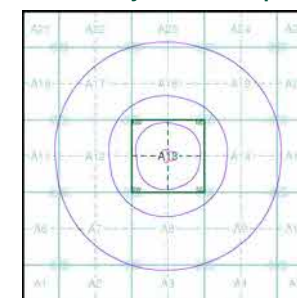
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 306309559_1_1
 Customer Ref: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

APPENDIX D

Geological Context

LOCATION : *Hayling Island* BOREHOLE No. : *21* in *331*
BOREHOLE DIA. : *12"* GROUND LEVEL :
DATE (Start) : *21.6.62.* WATER LEVEL : *3'-9"*

Dates	Description	Thickness	Depth	Sample	Remarks
	<i>Topsoil</i>	<i>2'-0"</i>	<i>0'-0"</i> <i>(0.61m)</i>		
	<i>Brown sandy clay with fragments of chalk</i>	<i>3'-0"</i>	<i>2'-0"</i> <i>(1.52m)</i>	<i>1</i>	
	<i>Firm grey/brown sandy clay with fragments of chalk</i>	<i>1'-6"</i>	<i>5'-0"</i> <i>(1.98m)</i>	<i>2</i>	<i>Brick earth</i>
	<i>Silty clay with flints and chalk</i>	<i>4'-6"</i>	<i>6'-6"</i>	<i>3</i>	
			<i>(3.35m)</i> <i>11'-0"</i>	<i>4</i>	
	<i>Soft chalk and flints.</i>	<i>4'-0"</i>	<i>(4.57m)</i> <i>15'-0"</i>	<i>5</i>	<i>UMCh</i>
				<i>6</i>	
					<i>End of borehole.</i>
					<i>R.T.W.</i>
					<i>27.10.82</i>

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	RMD	Raised Marine Deposits	Sand and Gravel	Not Supplied - Quaternary
	RTDU	River Terrace Deposits (Undifferentiated)	Sand, Silt and Clay	Not Supplied - Quaternary
	BTFU	Beach and Tidal Flat Deposits (Undifferentiated)	Clay, Silt, Sand and Gravel	Not Supplied - Quaternary
	RBD1	Raised Beach Deposits, 1	Sand and Gravel	Not Supplied - Quaternary
	HEAD	Head	Clay And Gravel	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LC	London Clay Formation	Clay, Silt and Sand	Not Supplied - Ypresian
	BOSA	Bognor Sand Member	Sand	Not Supplied - Eocene
	LMBE	Lambeth Group	Clay, Silt and Sand	Not Supplied - Thanetian
	LPCK	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsmouth Chalk Formation (Undifferentiated)	Chalk	Not Supplied - Turonian

Geology 1:50,000 Maps

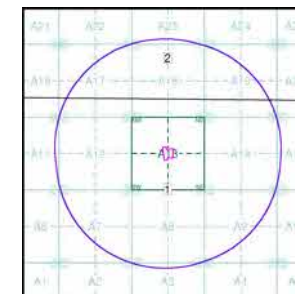
This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	1	Map ID:	2
Map Sheet No:	331	Map Sheet No:	316
Map Name:	Portsmouth	Map Name:	Fareham
Map Date:	1994	Map Date:	1998
Bedrock Geology:	Available	Bedrock Geology:	Available
Superficial Geology:	Available	Superficial Geology:	Available
Artificial Geology:	Available	Artificial Geology:	Available
Faults:	Not Supplied	Faults:	Not Supplied
Landslip:	Available	Landslip:	Available
Rock Segments:	Not Supplied	Rock Segments:	Not Supplied

Geology 1:50,000 Maps - Slice A

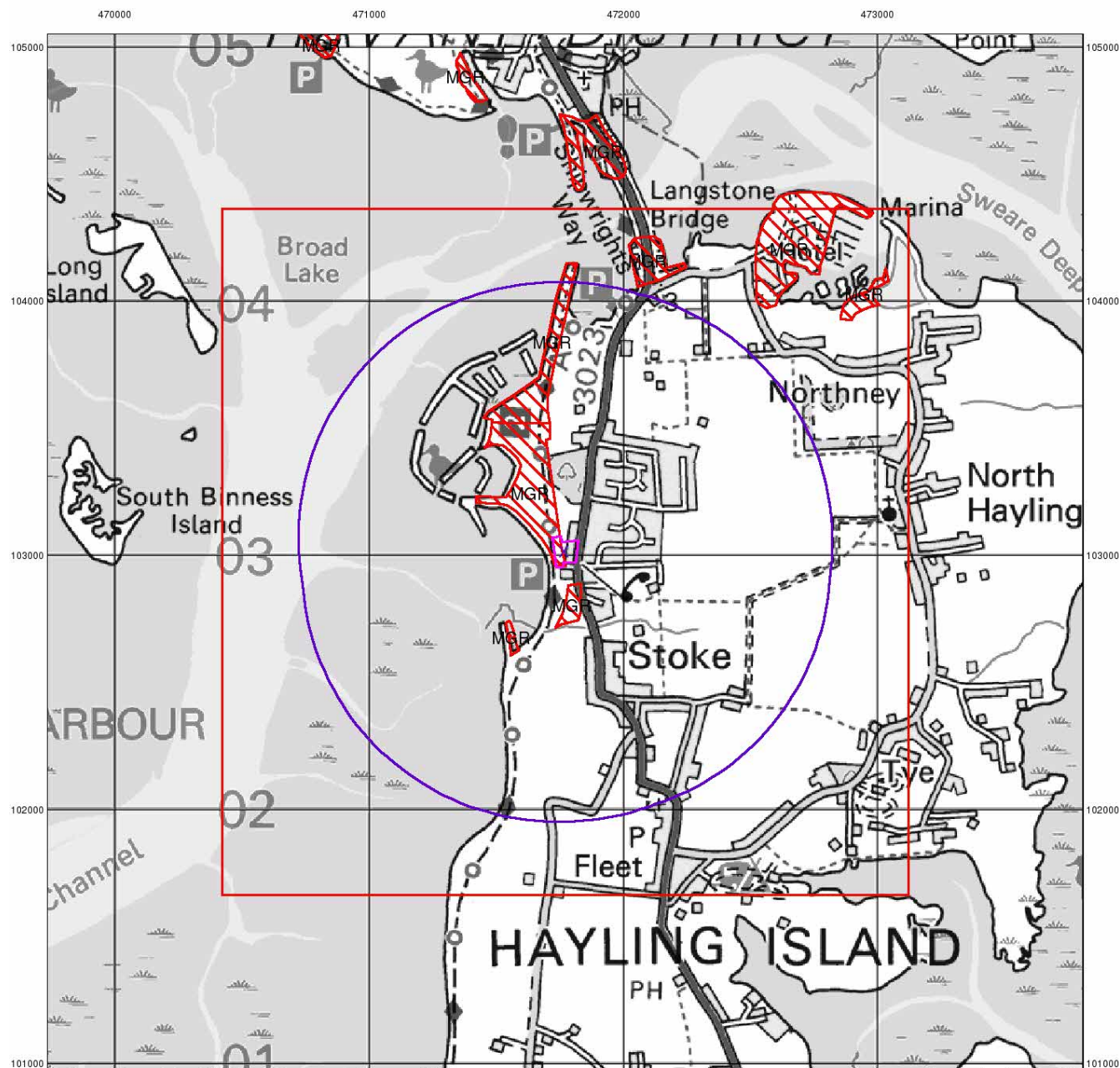


Order Details:

Order Number:	306309559_1_1
Customer Reference:	30818
National Grid Reference:	471770, 103020
Slice:	A
Site Area (Ha):	0.86
Search Buffer (m):	1000

Site Details:

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Artificial Ground and Landslip

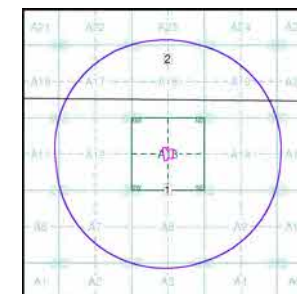
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



Order Details:

Order Number: 306309559_1_1
Customer Reference: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 1000

Site Details:

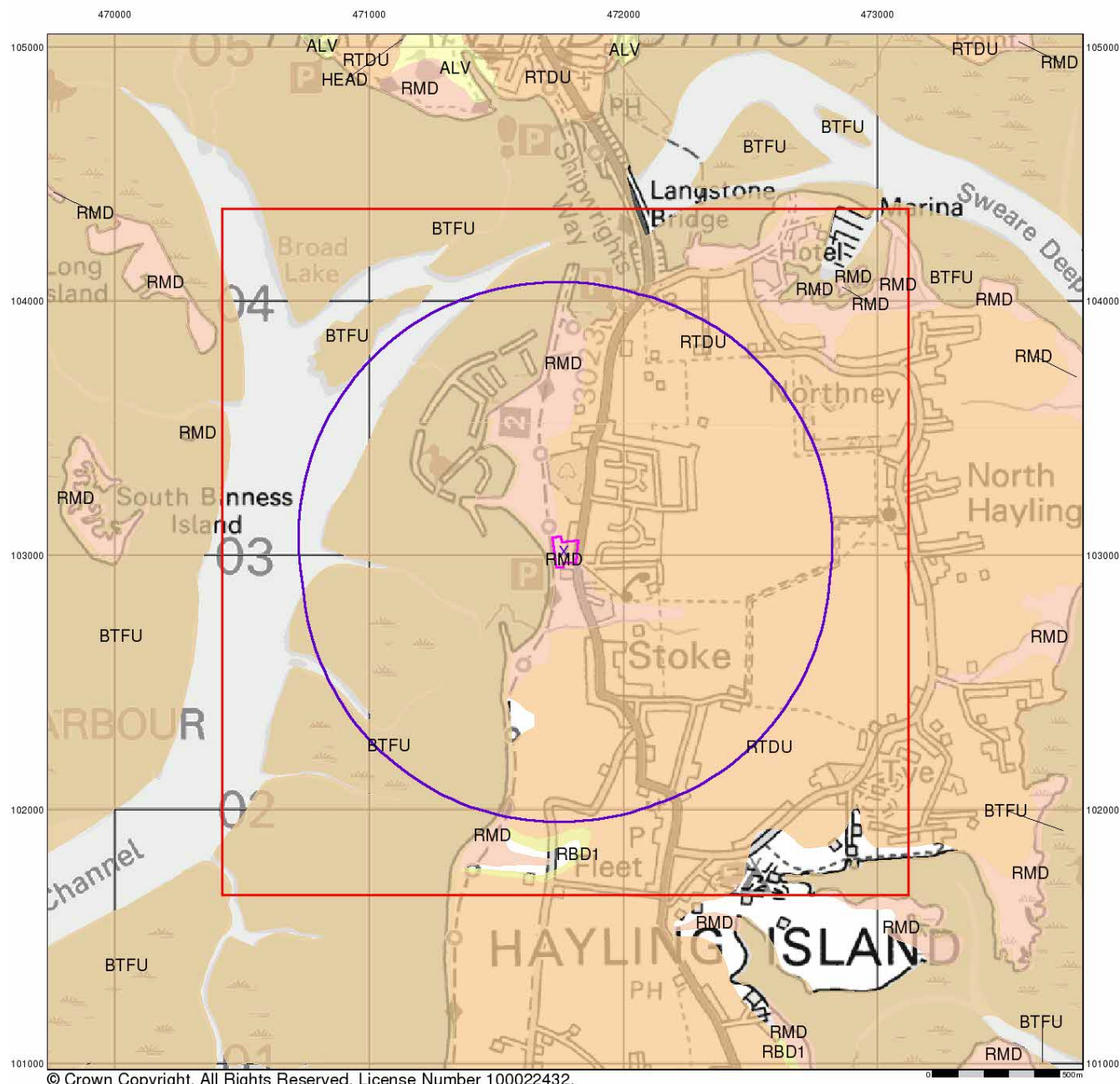
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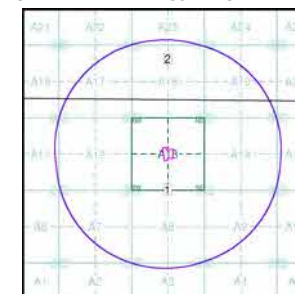
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details:

Order Number: 306309559_1_1
 Customer Reference: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details:

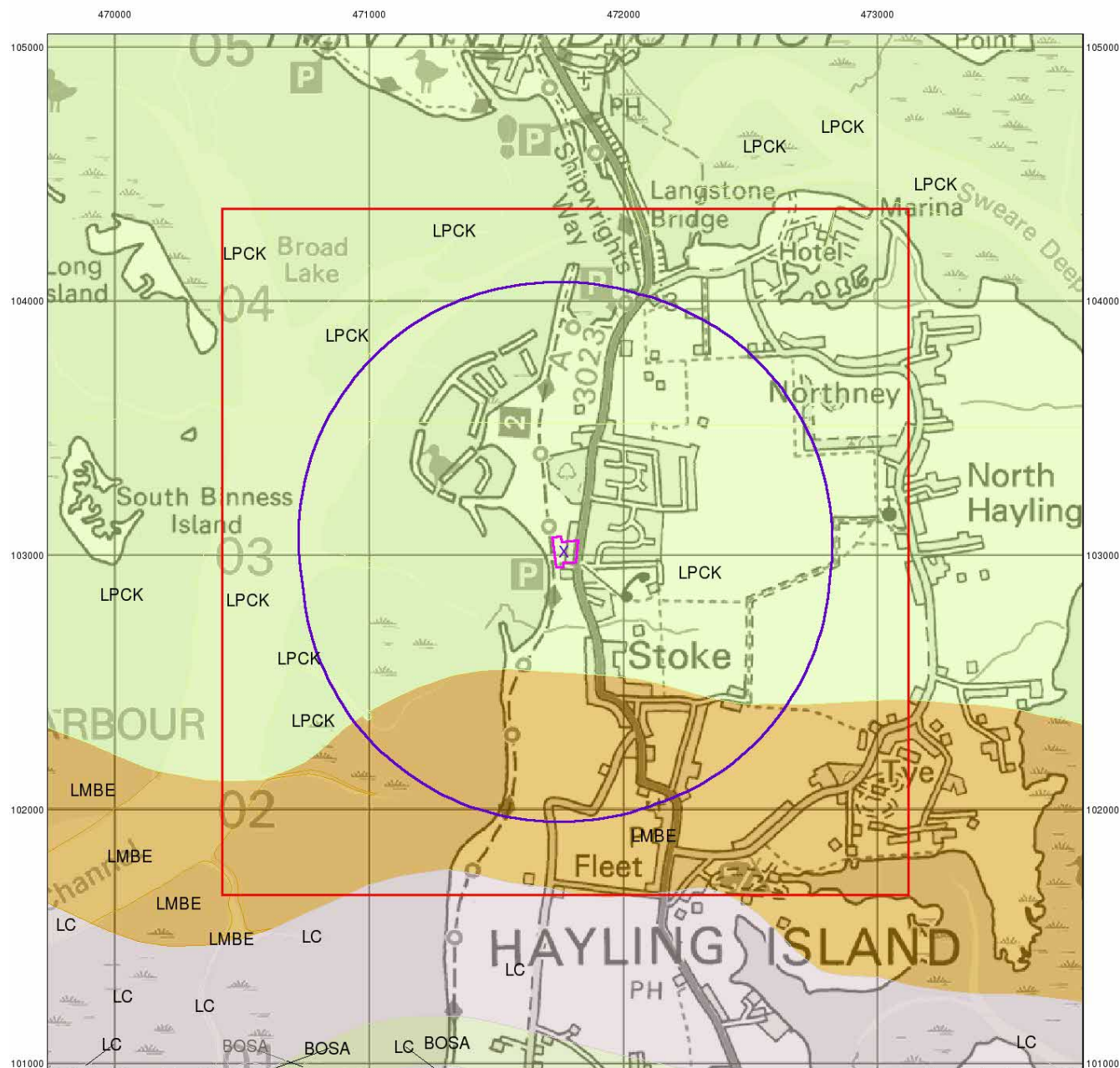
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Bedrock and Faults

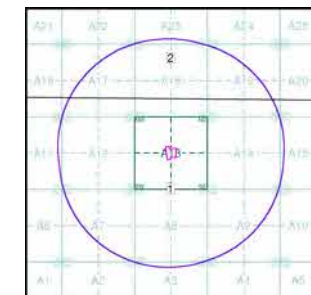
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



Order Details:

Order Number: 306309559_1_1
Customer Reference: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 1000

Site Details:

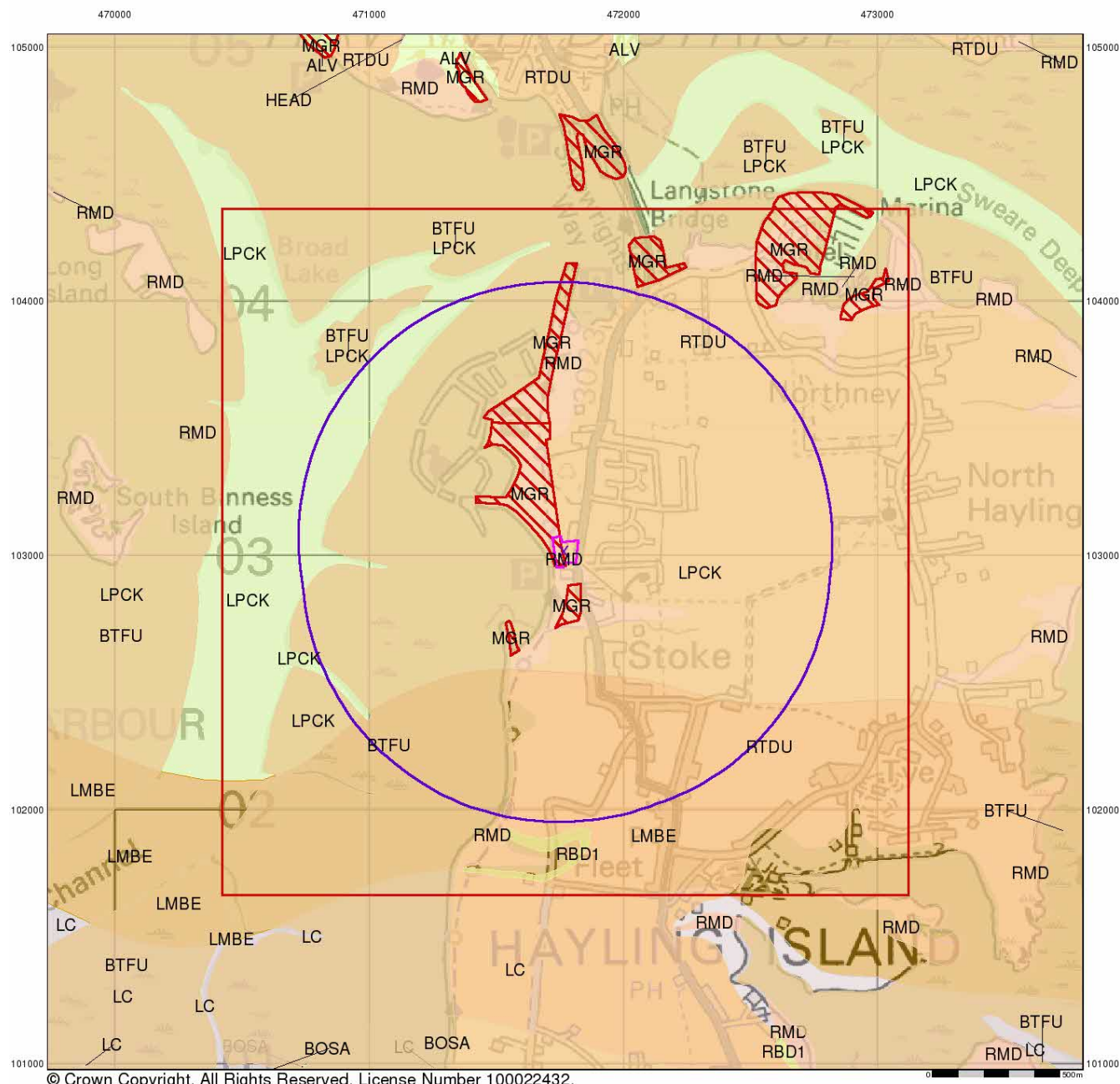
Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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Page 4 of 5



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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

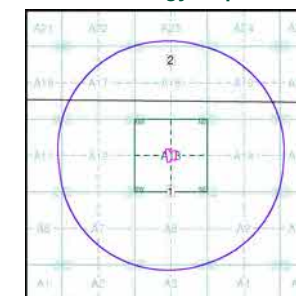
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

Order Number: 306309559_1_1
Customer Reference: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 1000

Site Details:

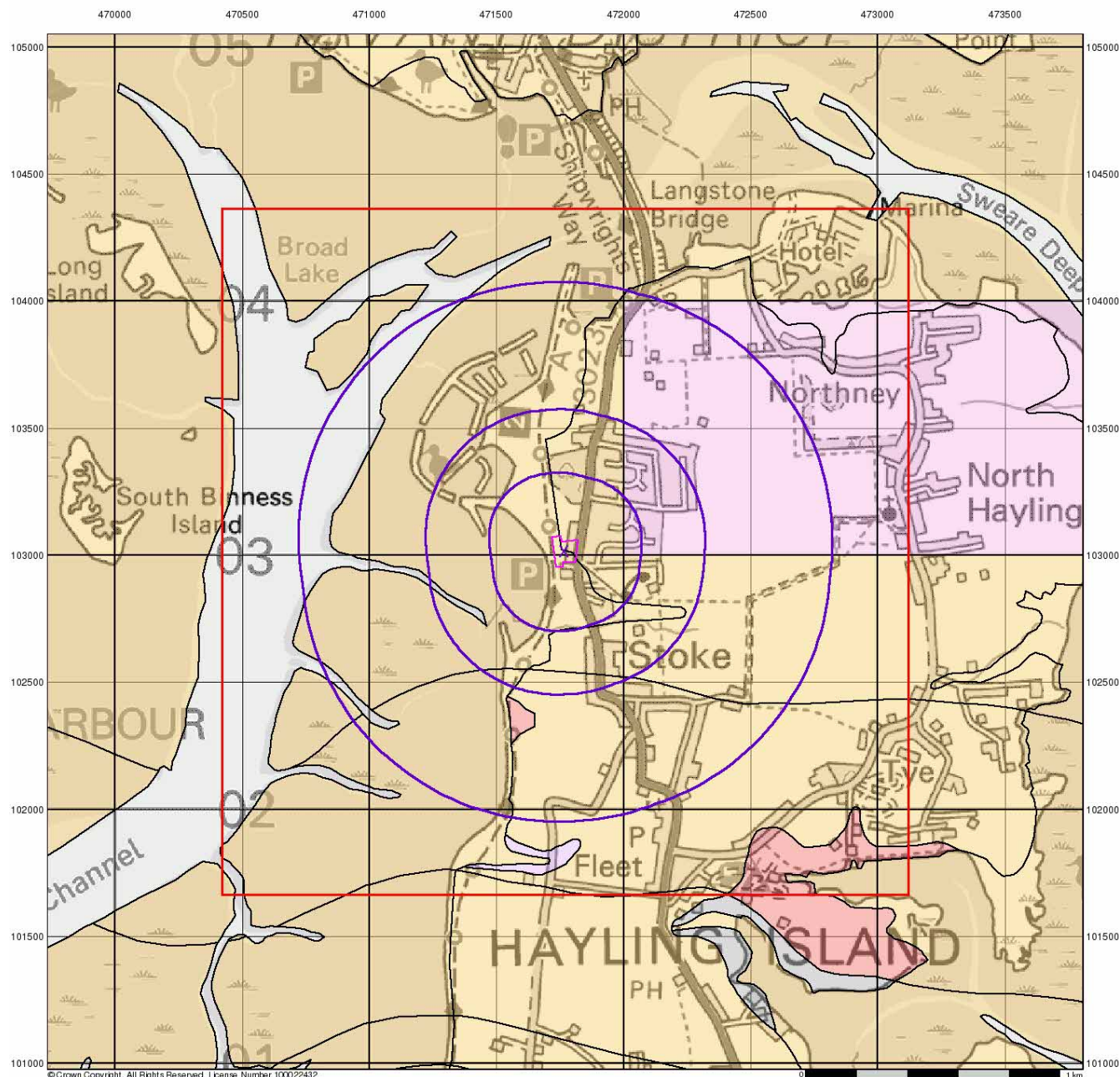
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Web: www.envirocheck.co.uk

APPENDIX E

Groundwater Vulnerability and Flood Risk Maps



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Groundwater Vulnerability

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Bedrock Aquifers

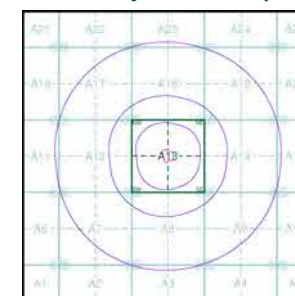
- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

Superficial Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

- Unproductive Aquifer
- Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

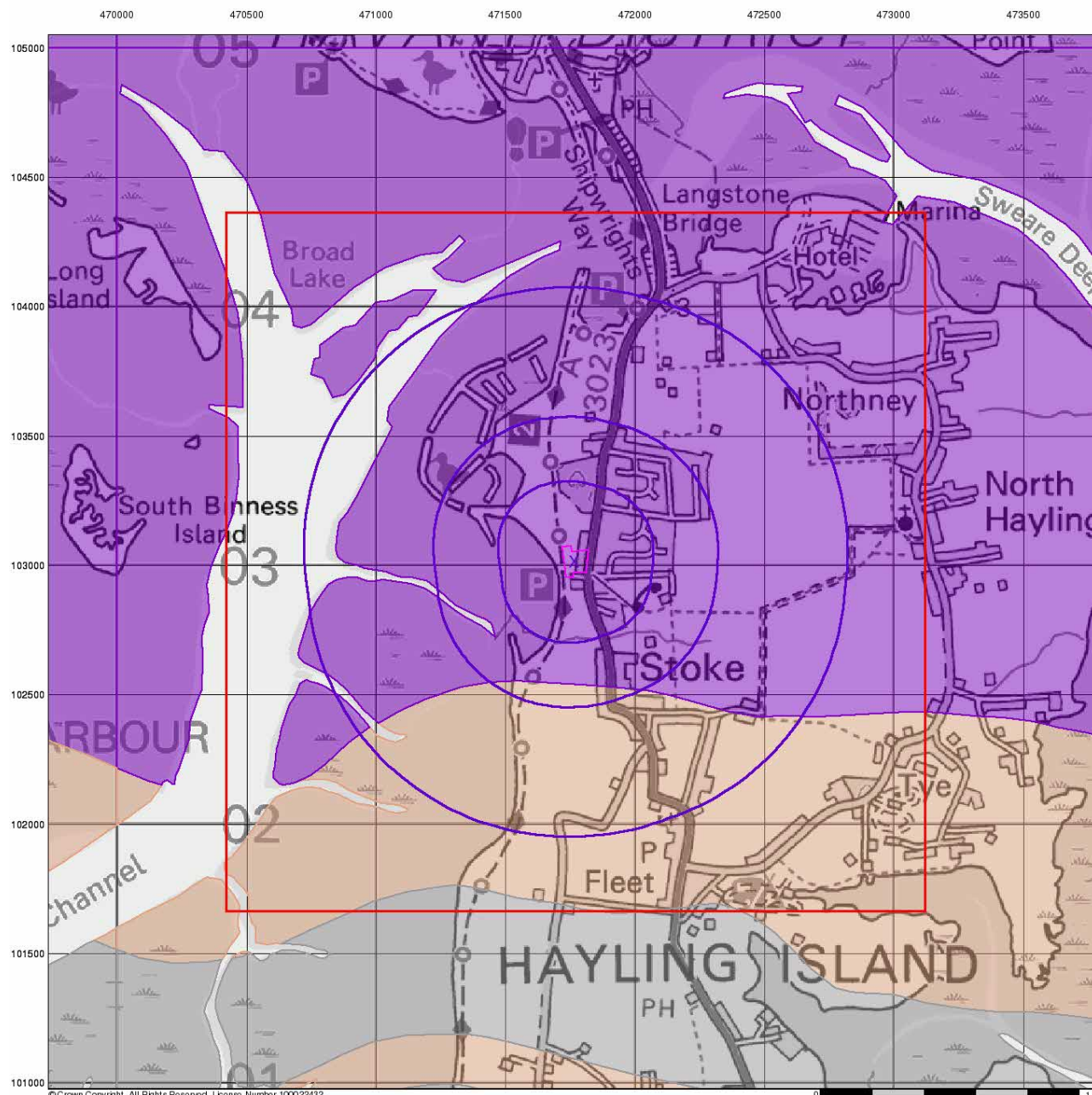
Order Number: 306309559_1_1
 Customer Ref: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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0 1 km

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Bedrock Aquifer Designation

General

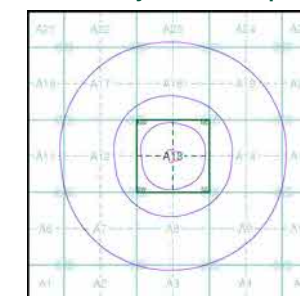
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

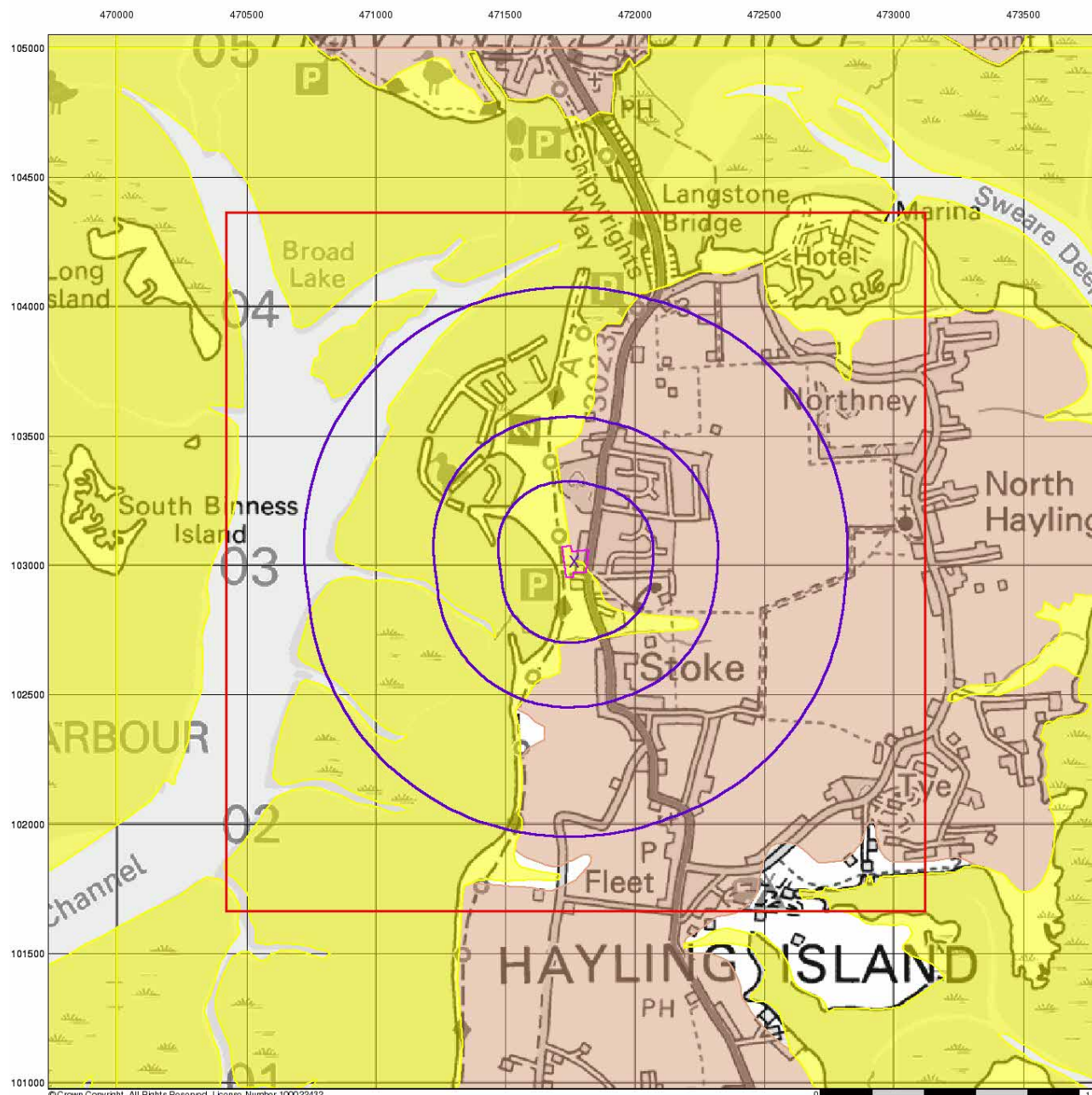
Order Number: 306309559_1_1
 Customer Ref: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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Superficial Aquifer Designation

General

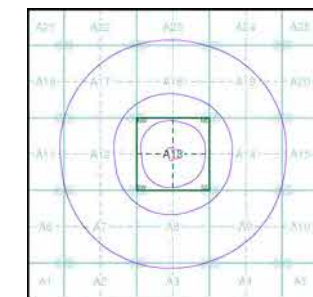
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

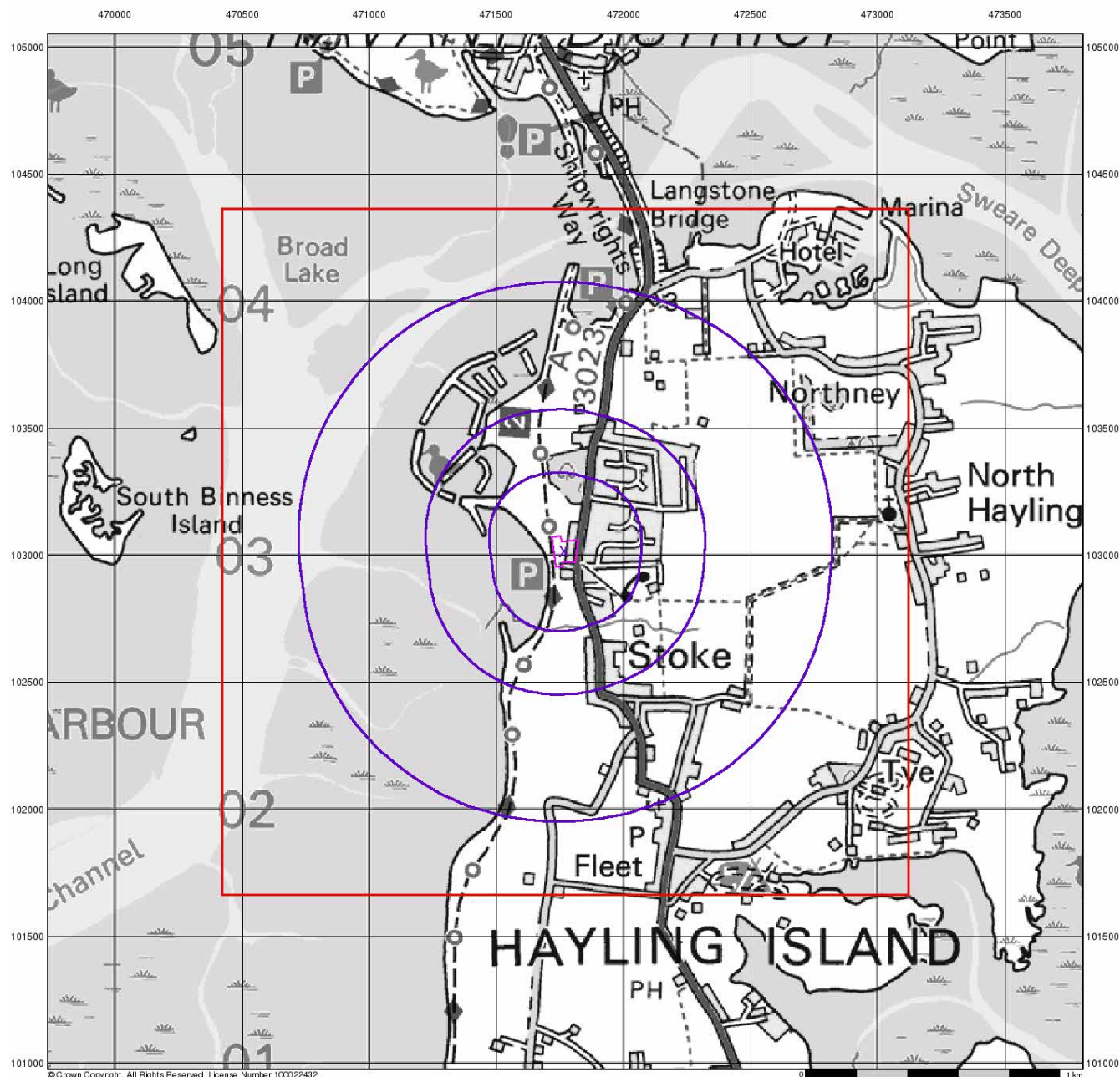
Order Number: 306309559_1_1
 Customer Ref: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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Source Protection Zones

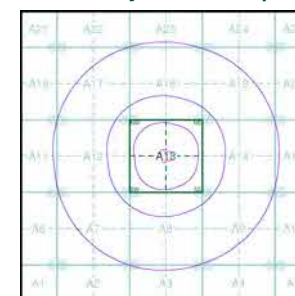
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

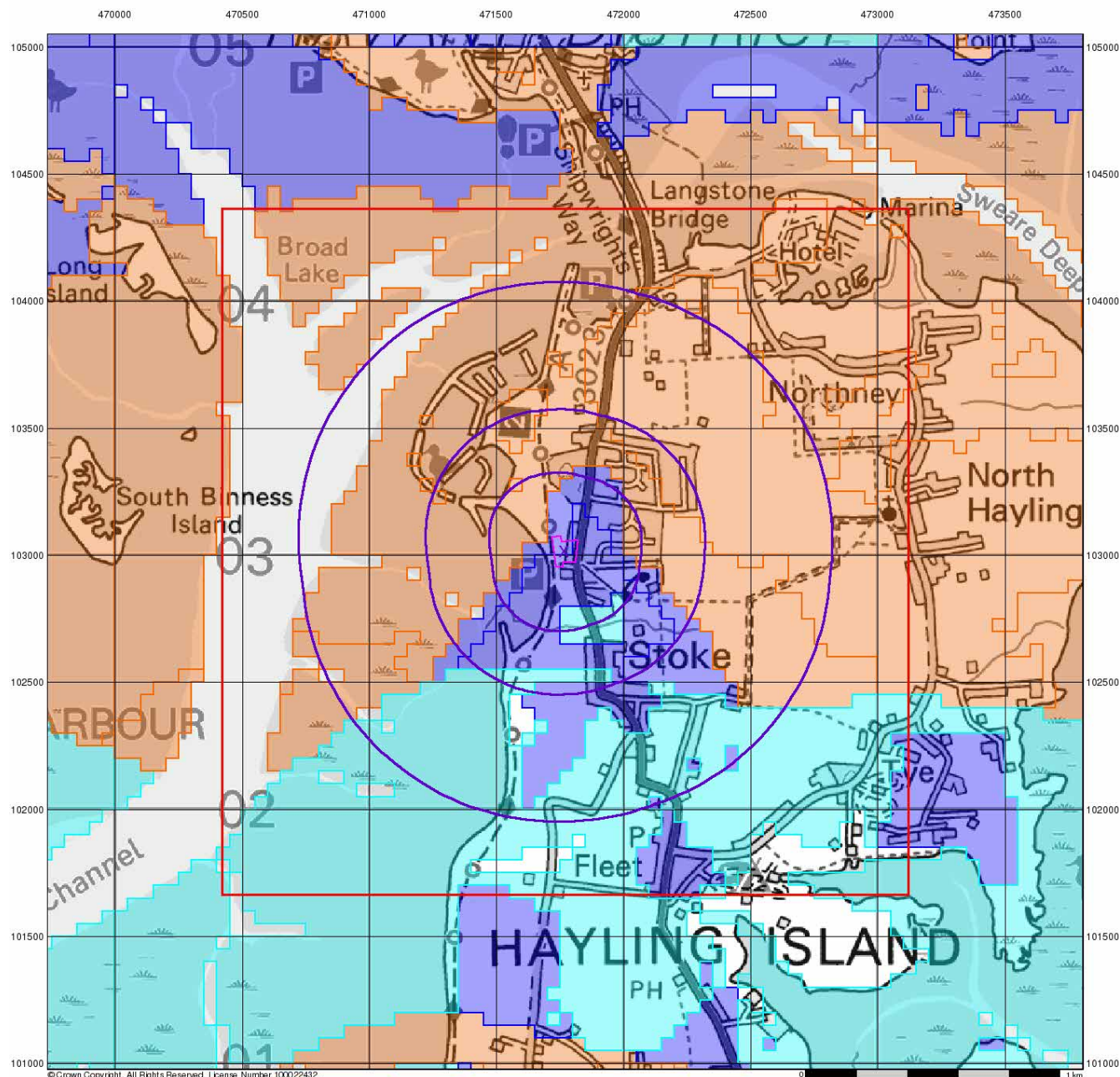
Order Number: 306309559_1_1
 Customer Ref: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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BGS Flood GFS Data

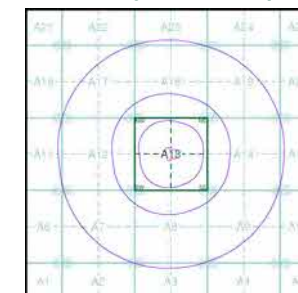
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 306309559_1_1
 Customer Ref: 30818
 National Grid Reference: 471770, 103020
 Slice: A
 Site Area (Ha): 0.86
 Search Buffer (m): 1000

Site Details

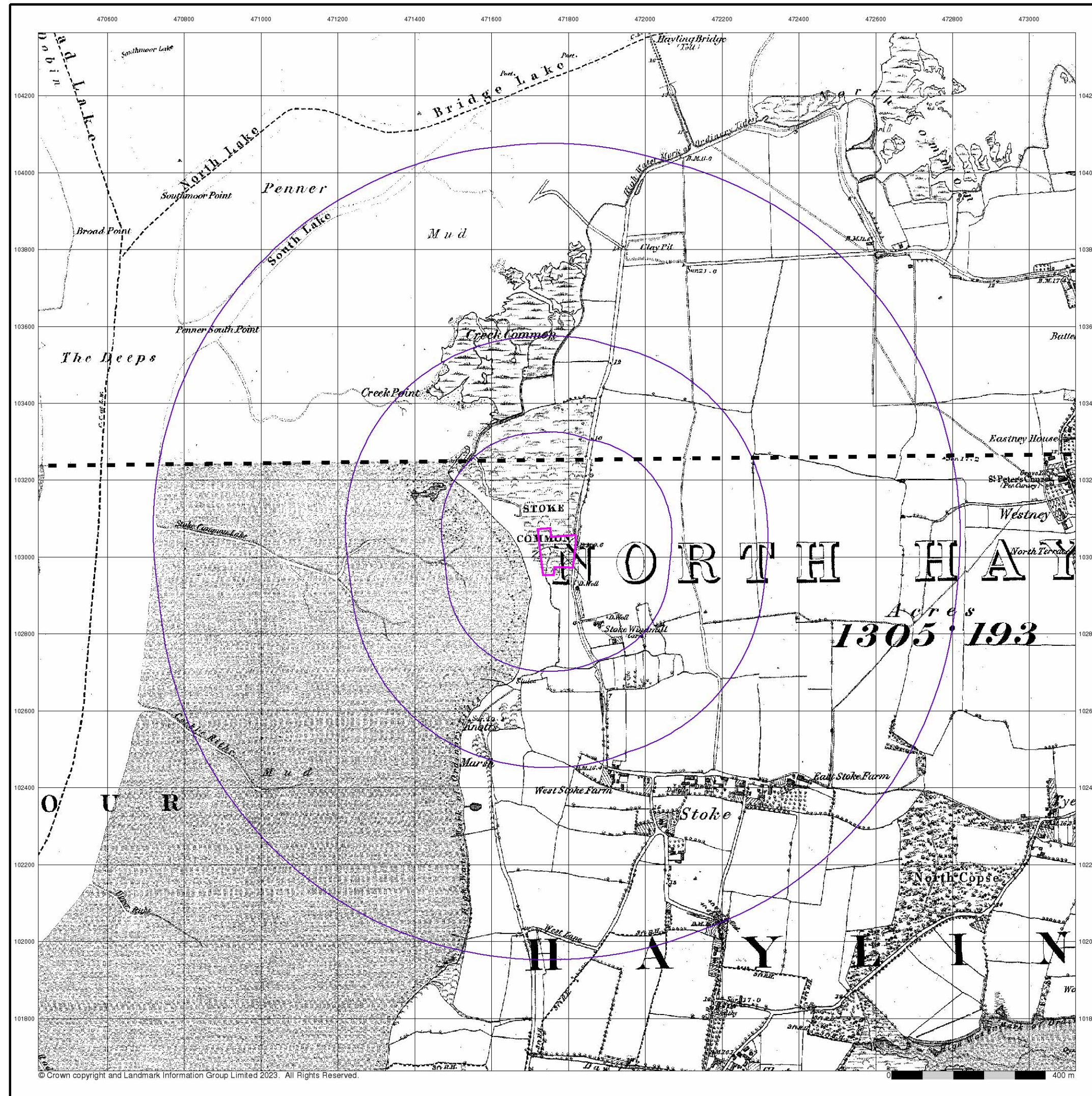
Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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APPENDIX F

Selection of Historic Maps



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Hampshire & Isle Of Wight

Published 1870 - 1871

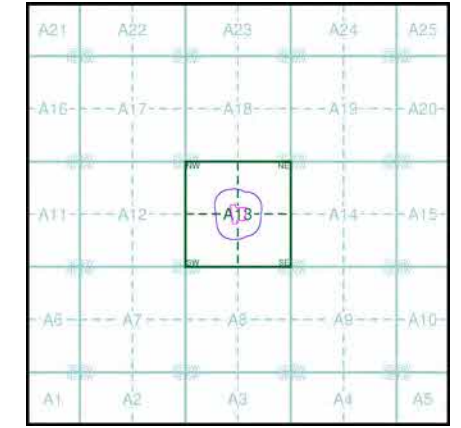
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

07600
1870
1:10,560
08400
1871
1:10,560

Historical Map - Slice A

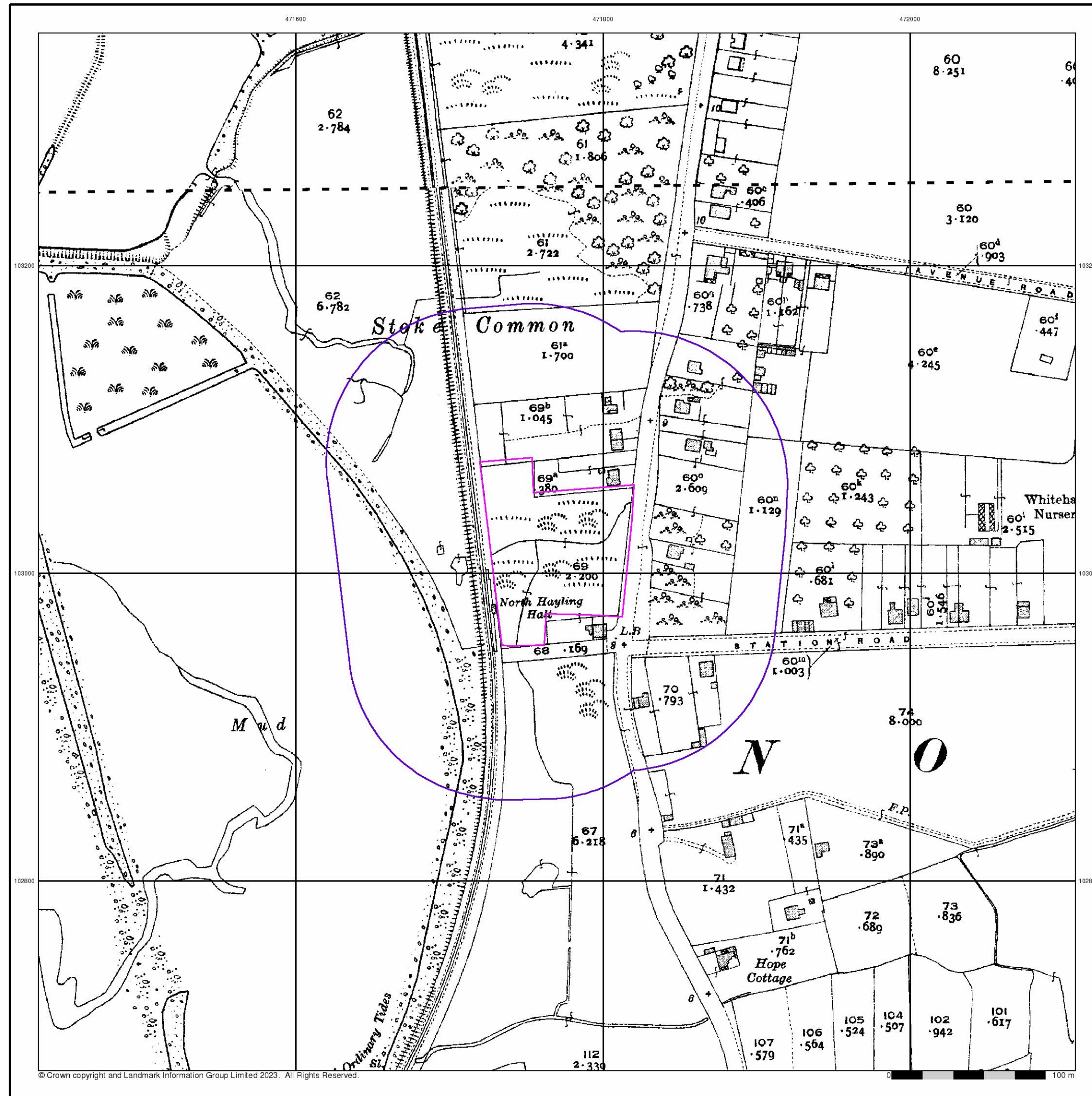


Order Details

Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG



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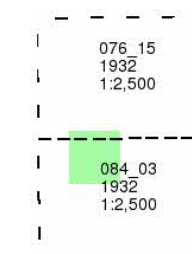
Hampshire & Isle Of Wight

Published 1932

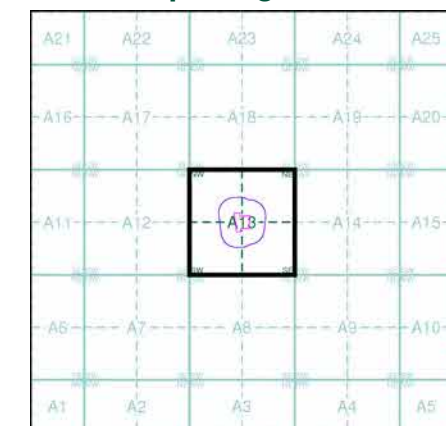
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13

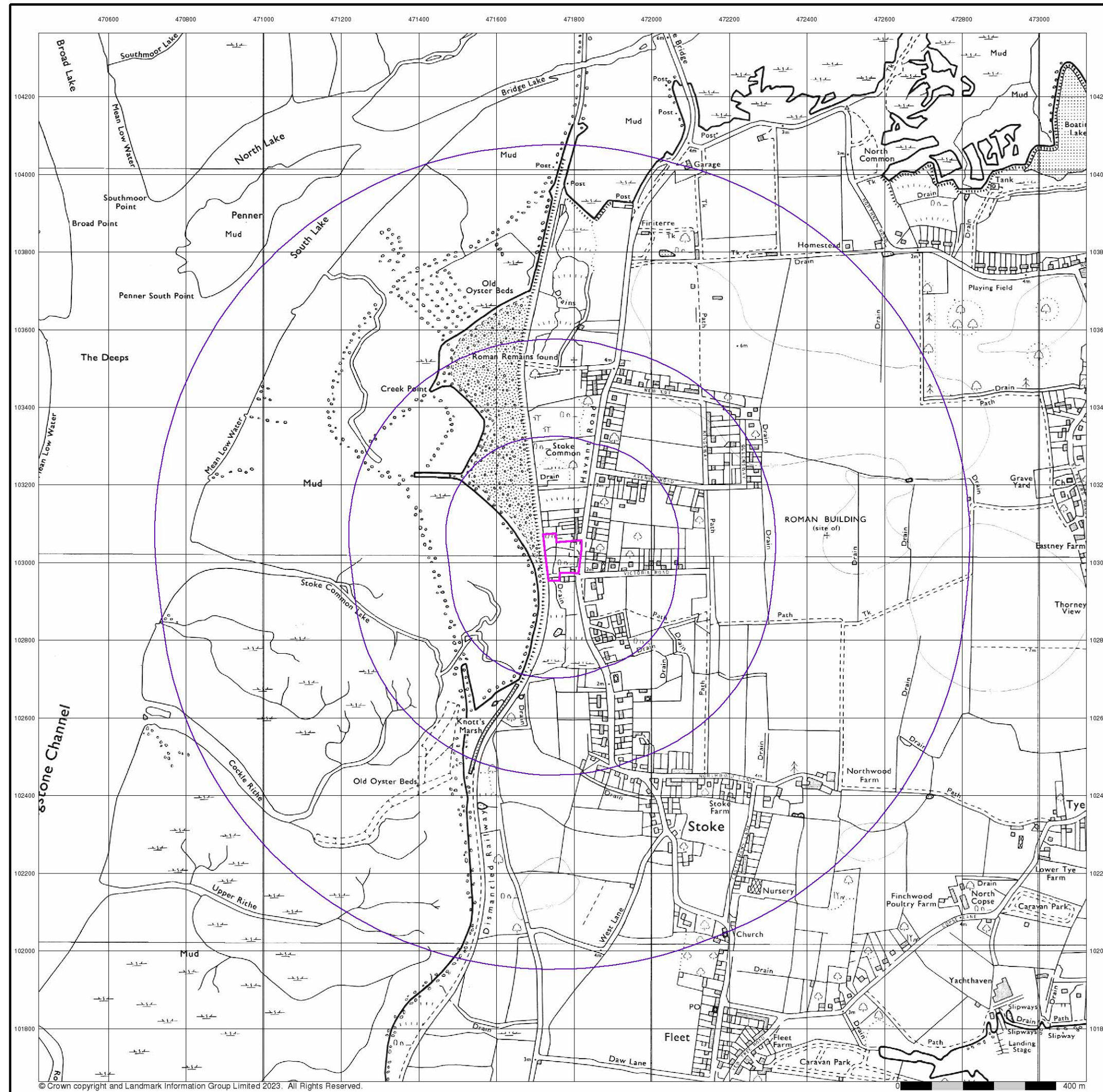


Order Details

Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 100

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG



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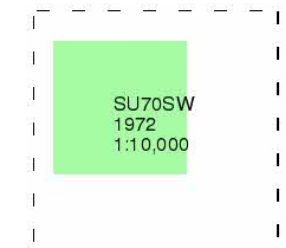
Ordnance Survey Plan

Published 1972

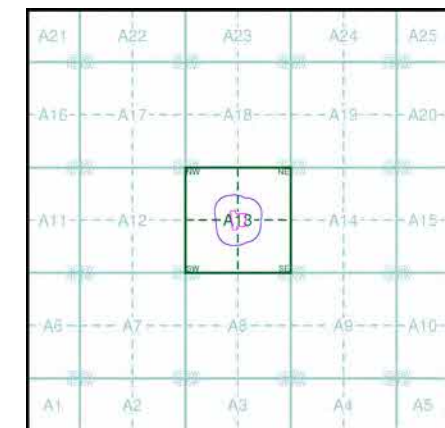
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG



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Large-Scale National Grid Data

Published 1993

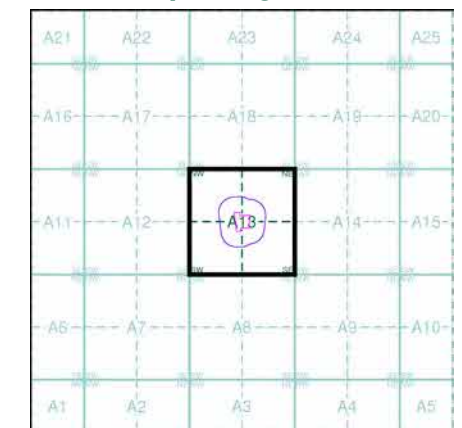
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SU7103	SU7203
1993	1993
12,500	12,500
SU7102	SU7202
1993	1993
12,500	12,500

Historical Map - Segment A13



Order Details

Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 100

Site Details

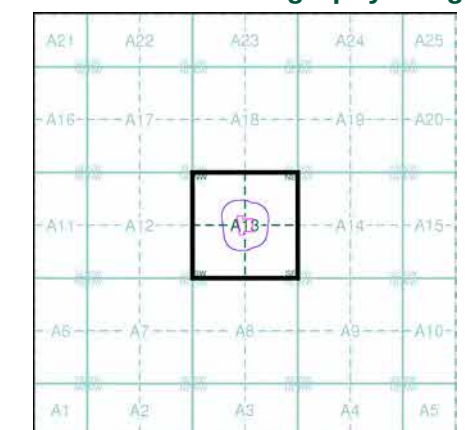
Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

Historical Aerial Photography

Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

Order Number: 306309559_1_1
Customer Ref: 30818
National Grid Reference: 471770, 103020
Slice: A
Site Area (Ha): 0.86
Search Buffer (m): 100

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG



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VectorMap Local

Published 2022

Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

SU70SW

2022

Variable

Historical Map - Slice A

Order Details

Order Number:	306309559_1_1
Customer Ref:	30818
National Grid Reference:	471770, 103020
Slice:	A
Site Area (Ha):	0.86
Search Buffer (m):	1000

Site Details

Hayling island -181 Havant Rd, Hayling Island, PO11 0LG

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A Landmark Information Group Service v50.0 25-Jan-2023 Page 24 of 24

APPENDIX G

Petroleum Officer Records

PETROLEUM SITE DETAILS RECORD

Address: HAYLING ISLAND SERVICE STATION HAVANT ROAD HAYLING ISLAND			Licence No: B4/63	Date of Associated Plan: 18 July 1997	Sheet: 1 of: 1	
TANK NO	1	2	3	4	5	6
Construction	SSS	SSS	SSS	SSS	SSS	
Capacity (Litres)	18,000	18,000	36,000	36,000	22,500	
Overfill Prevention	YES	YES	YES	YES	YES	
Leak Detection	NO	NO	NO	NO	NO	
Type of Fuel	SUL	UL	D	UL	D	
Pump Nos From Tank	3, 4, 9, 10	1, 2	3, 4, 7, 8 9, 10	3, 4, 7, 8 9, 10	5, 6, 11 12	
Vapour Balancing	YES	YES	YES	YES	NO	
DCD Licence	YES	YES	YES	YES	YES	
Installation Date	1983	1983	1983	1983	1983	
Test Date:						
20 Years						
25 Years						
30 Years						
30 Plus Years	Biannual Test Required					

Remarks:

Tanks

SSS = Single Skin Steel
 DSS = Double Skin Steel
 GRP = Glass Reinforced Plastic
 IDU = Installation Date Unknown

Contents

SUL = Super Unleaded Petroleum Spirit
 UL = Unleaded Petroleum Spirit
 4* = Four Star Petroleum Spirit
 D = Diesel
 P = Paraffin
 WO = Waste Oil
 LO = Lubrication Oil
 LRP = Lead Replacement Petrol

ADDRESS:- HAVANT ROAD
HAYLING ISLAND
HANTS

LICENCE NO:- 34/63

FILE NO:-

DATE:- 18.7.97 *ND*

CAD NO:- B0463.PET

PLAN REF:- JHF. HRF.

NOT TO SCALE

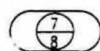
S H O P

EG

C.P

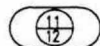
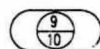
⑦

4xDP
2xSB



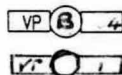
CAR
WASH

DCD



H
A
V
A
N
T

R
O
A
D

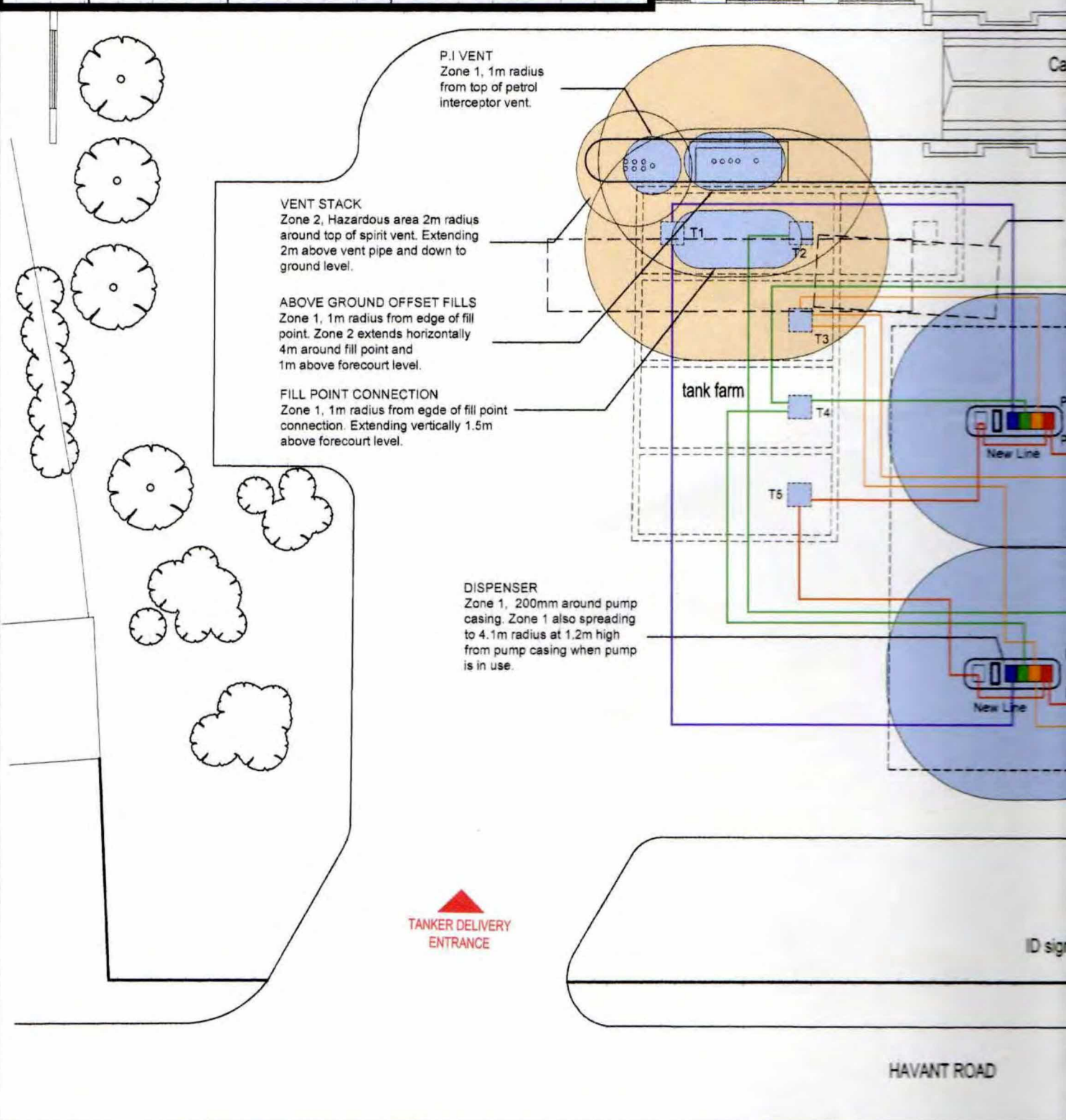
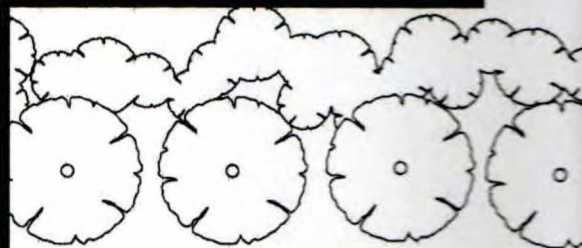


TANK/PIPEWORK/PUMP DETAILS

HAZARDOUS AREA CLASSIFICATION

TANK No.	CAPACITY (97%)	GRADE	PUMPS SERVED
T1	17,270 Litres	SUPER UNLEADED	P3/4 + P9/10
T2	17,270 Litres	UNLEADED	P1/2
T3	35,540 Litres	DIESEL	P1/2 + P3/4 + P7/8 + P9/10
T4	34,540 Litres	UNLEADED	P3/4 + P7/8 + P9/10
T5	21,590 Litres	SUPREME DIESEL	P1/2 + P3/4 + P7/8 + P9/10

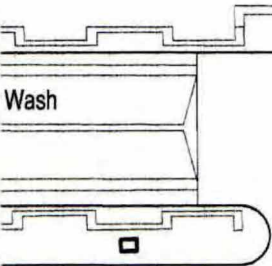
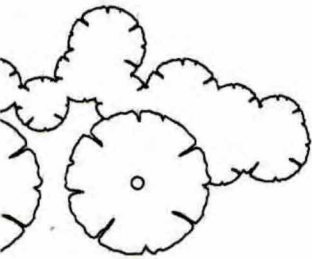
	ZONE 1
	ZONE 2



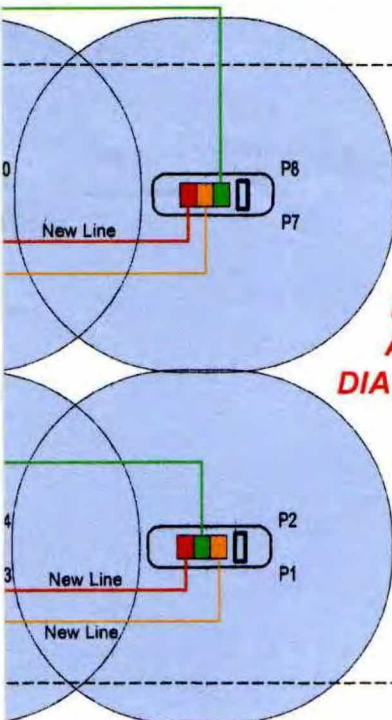
**This drawing indicates
new Supreme Diesel
Grade & was produced
using Survey
information
(dated Feb 2005)**

NOTES

Figured dimensions must be taken in preference to scaled dimensions. Contractors, Sub-Contractors and Suppliers must verify all dimensions on site before commencing or preparing shop drawings. All drawings are subject to Copyright.



DELIVERY TANKER
Zone 2, 4m radius from edge of fill point
connection. Extending vertically 1m above
forecourt level.



**FUEL LINES
ARE SHOWN
DIAGRAMMATICAL**

Trash

Sales Building

TANKER
DELIVERY EXIT

REVISION		
no.	date	details

ALLAN.B. MATTHEWS A.R.I.B.A.



37 Fore Street,
Bovey Tracey, Devon
TQ13 9AD

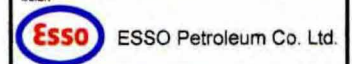
Tel : (01626) 833727

Fax : (01626) 833102

drawingoffice@allanbmattthews.com

www.allanbmattthews.com

CLIENT



JOB

Hayling Service Station
181-183 Havant Road
Hayling Island, Hants
PO11 0LG

DRAWING TITLE

Pump to Tank Arrangement
Showing Hazardous Zones
Areas & Classification

M/1963

drawn by: DH	date: 10/2012
checked by:	date:
Scale: NTS	Type: DSEAR
PBL: 200816	ABM Job No: 1963
Drawg No: 052	Revision:

APPENDIX H

Site Specific Window Sample Borehole Logs

Well

Well

Well

Well

Well

APPENDIX I

Laboratory Results –Environmental



DETS

Certificate of Analysis

Certificate Number 22-26987

Issued: 09-Jan-23

Client EPS (Leeds) Ltd
10-12 East Parade
Leeds
LS1 2BH

Our Reference 22-26987

Client Reference UK22.6230

Order No 31023

Contract Title Hayling Island

Description 8 Soil samples, 2 Leachate samples, 4 Water samples.

Date Received 23-Dec-22

Date Started 23-Dec-22

Date Completed 09-Jan-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 22-26987
Client Ref UK22.6230
Contract Title Hayling Island

Lab No	2104219	2104220	2104221	2104222	2104223	2104224
Sample ID	WS01 ES1	WS01 ES3	WS02 ES1	WS02 ES2	WS02 ES3	WS03 ES2
Depth	0.40-0.80	4.50-5.00	0.00-0.20	0.60-1.00	2.50-3.00	2.50-2.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/12/2022	21/12/2022	21/12/2022	21/12/2022	21/12/2022	21/12/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Preparation									
Moisture Content	DETSC 1004	0.1	%	15					
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	4.3	0.7	11	8.5		
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg		< 0.2	0.8	1.2		
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.5	0.5	0.4		
Chromium	DETSC 2301#	0.15	mg/kg	9.8	1.3	17	17		
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0					
Copper	DETSC 2301#	0.2	mg/kg	7.6	2.4	27	21		
Lead	DETSC 2301#	0.3	mg/kg	5.7	4.0	58	44		
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.05	< 0.05		
Nickel	DETSC 2301#	1	mg/kg	8.7	1.8	15	13		
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.7	< 0.5	< 0.5		
Zinc	DETSC 2301#	1	mg/kg	26	11	79	67		
Inorganics									
pH	DETSC 2008#		pH		8.5	7.9	7.8	8.5	8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg		< 0.1	0.2	0.2		
Organic matter	DETSC 2002#	0.1	%		0.2	2.9	3.4		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l					16	18
Sulphide	DETSC 2024*	10	mg/kg		< 10	< 10	< 10		
Sulphur as S, Total	DETSC 2320	0.01	%					0.01	0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.05	0.06	0.06	0.03	0.05
Petroleum Hydrocarbons									
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50		
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20	< 1.20	< 1.20		
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50		
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	6.64	5.83	9.09	5.68		
Aliphatic C5-C35: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00		
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90		
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50		
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	< 0.60	< 0.60	3.08	< 0.60		
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40	2.70	< 1.40		
Aromatic C5-C35: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00		

Summary of Chemical Analysis

Soil Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104219	2104220	2104221	2104222	2104223	2104224
Sample ID	WS01 ES1	WS01 ES3	WS02 ES1	WS02 ES2	WS02 ES3	WS03 ES2
Depth	0.40-0.80	4.50-5.00	0.00-0.20	0.60-1.00	2.50-3.00	2.50-2.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/12/2022	21/12/2022	21/12/2022	21/12/2022	21/12/2022	21/12/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total C5-C35: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00		
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01		
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01		
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03					
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03					
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03					
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03					
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03					
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03					
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03					
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03					
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03					
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Acenaphthylene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Acenaphthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	0.2		
Fluorene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	0.3		
Phenanthrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	0.5		
Anthracene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	0.6		
Pyrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	0.5		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Chrysene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10					

Summary of Chemical Analysis

Soil Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104219	2104220	2104221	2104222	2104223	2104224
Sample ID	WS01 ES1	WS01 ES3	WS02 ES1	WS02 ES2	WS02 ES3	WS03 ES2
Depth	0.40-0.80	4.50-5.00	0.00-0.20	0.60-1.00	2.50-3.00	2.50-2.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/12/2022	21/12/2022	21/12/2022	21/12/2022	21/12/2022	21/12/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAH 16 Total	DETSC 3301	1.6	mg/kg		< 1.6	< 1.6	2.1		
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		< 0.3	< 0.3	< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104225	2104226
Sample ID	WS03 ES3	WS04 ES1
Depth	4.50-4.80	0.70-1.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	21/12/2022	21/12/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Preparation					
Moisture Content	DETSC 1004	0.1	%		15
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg		9.5
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg		
Cadmium	DETSC 2301#	0.1	mg/kg		0.2
Chromium	DETSC 2301#	0.15	mg/kg		21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0
Copper	DETSC 2301#	0.2	mg/kg		14
Lead	DETSC 2301#	0.3	mg/kg		27
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05
Nickel	DETSC 2301#	1	mg/kg		17
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5
Zinc	DETSC 2301#	1	mg/kg		53
Inorganics					
pH	DETSC 2008#		pH	8.8	
Cyanide, Total	DETSC 2130#	0.1	mg/kg		
Organic matter	DETSC 2002#	0.1	%		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	< 10	
Sulphide	DETSC 2024*	10	mg/kg		
Sulphur as S, Total	DETSC 2320	0.01	%	0.02	
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.05	
Petroleum Hydrocarbons					
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg		< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg		< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg		< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg		< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg		< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg		< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg		< 3.40
Aliphatic C5-C35: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg		< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg		< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg		< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg		< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg		< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg		< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg		< 0.60
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg		< 1.40
Aromatic C5-C35: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg		< 10.00

Summary of Chemical Analysis

Soil Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104225	2104226
Sample ID	WS03 ES3	WS04 ES1
Depth	4.50-4.80	0.70-1.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	21/12/2022	21/12/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
TPH Ali/Aro Total C5-C35: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg		< 10.00
Benzene	DETSC 3321#	0.01	mg/kg		
Ethylbenzene	DETSC 3321#	0.01	mg/kg		
Toluene	DETSC 3321#	0.01	mg/kg		
Xylene	DETSC 3321#	0.01	mg/kg		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.06
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.21
Pyrene	DETSC 3303#	0.03	mg/kg		0.19
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.07
Chrysene	DETSC 3303	0.03	mg/kg		0.11
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.10
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.04
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		0.08
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		0.05
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		0.05
Naphthalene	DETSC 3301	0.1	mg/kg		
Acenaphthylene	DETSC 3301	0.1	mg/kg		
Acenaphthene	DETSC 3301	0.1	mg/kg		
Fluorene	DETSC 3301	0.1	mg/kg		
Phenanthrene	DETSC 3301	0.1	mg/kg		
Anthracene	DETSC 3301	0.1	mg/kg		
Fluoranthene	DETSC 3301	0.1	mg/kg		
Pyrene	DETSC 3301	0.1	mg/kg		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		
Chrysene	DETSC 3301	0.1	mg/kg		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		0.97

Summary of Chemical Analysis

Soil Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104225	2104226
Sample ID	WS03 ES3	WS04 ES1
Depth	4.50-4.80	0.70-1.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	21/12/2022	21/12/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAH 16 Total	DETSC 3301	1.6	mg/kg		
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		

Summary of Chemical Analysis

Water Samples

Our Ref 22-26987
Client Ref UK22.6230
Contract Title Hayling Island

Lab No	2104215	2104216	2104217	2104218
Sample ID	WS01 GW1	WS02 GW1	WS03 GW1	WS04 GW1
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	21/12/2022	21/12/2022	21/12/2022	21/12/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Chromatogram	*	0		Y	Y	N	Y
Petroleum Hydrocarbons							
Aliphatic C5-C6: HS_1D_AL	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8: HS_1D_AL	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10: HS_1D_AL	DETS 3322	0.1	ug/l	19	23	< 0.1	34
Aliphatic C10-C12: EH_CU_1D_AL	DETS 3072*	1	ug/l	8.8	16	< 1.0	16
Aliphatic C12-C16: EH_CU_1D_AL	DETS 3072*	1	ug/l	26	11	< 1.0	< 1.0
Aliphatic C16-C21: EH_CU_1D_AL	DETS 3072*	1	ug/l	29	18	< 1.0	< 1.0
Aliphatic C21-C35: EH_CU_1D_AL	DETS 3072*	1	ug/l	2.8	14	< 1.0	< 1.0
Aliphatic C5-C35: EH_CU+HS_1D_AL	DETS 3072*	10	ug/l	86	82	< 10	50
Aromatic C5-C7: HS_1D_AR	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8: HS_1D_AR	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10: HS_1D_AR	DETS 3322	0.1	ug/l	27	35	< 0.1	51
Aromatic C10-C12: EH_CU_1D_AR	DETS 3072*	1	ug/l	9.4	< 1.0	< 1.0	< 1.0
Aromatic C12-C16: EH_CU_1D_AR	DETS 3072*	1	ug/l	34	< 1.0	< 1.0	< 1.0
Aromatic C16-C21: EH_CU_1D_AR	DETS 3072*	1	ug/l	42	< 1.0	< 1.0	< 1.0
Aromatic C21-C35: EH_CU_1D_AR	DETS 3072*	1	ug/l	14	< 1.0	< 1.0	< 1.0
Aromatic C5-C35: EH_CU+HS_1D_AR	DETS 3072*	10	ug/l	130	35	< 10	51
TPH Ali/Aro Total C5-C35: EH_CU+HS_1D_Total	DETS 3072*	10	ug/l	210	120	< 10	100
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	6.8	13	< 1.0	16
MTBE	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water VOC Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104215
Sample ID	WS01 GW1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	21/12/2022
Sampling Time	n/s

Test	Method	LOD	Units	
VOCs				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4
Chloroform	DETSC 3432	1	ug/l	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1
Benzene	DETSC 3432	1	ug/l	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
Toluene	DETSC 3432	1	ug/l	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1
Styrene	DETSC 3432	1	ug/l	< 1
Bromoform	DETSC 3432	1	ug/l	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1

Summary of Chemical Analysis

Water VOC Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104215
Sample ID	WS01 GW1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	21/12/2022
Sampling Time	n/s

Test	Method	LOD	Units	
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1
Naphthalene	DETSC 3432	1	ug/l	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1
MTBE	DETSC 3432*	1	ug/l	< 1

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 22-26987
Client Ref UK22.6230
Contract Title Hayling Island
Sample Id WS01 ES1 0.40-0.80

Sample Numbers 2104219 2104227
Date Analysed 06/01/2023

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	3.3
DETSC 2003# Loss On Ignition	%	1.5
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	1.9
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg
	10:1	LS10
DETSC 2306 Arsenic as As	0.31	< 0.01
DETSC 2306 Barium as Ba	21	0.21
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02
DETSC 2306 Chromium as Cr	0.59	< 0.1
DETSC 2306 Copper as Cu	2	0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.002
DETSC 2306 Molybdenum as Mo	2	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.1
DETSC 2306 Lead as Pb	0.81	< 0.05
DETSC 2306 Antimony as Sb	0.26	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 0.01
DETSC 2055 Chloride as Cl	1200	< 100
DETSC 2055* Fluoride as F	150	1.5
DETSC 2055 Sulphate as SO4	2200	< 100
DETSC 2009* Total Dissolved Solids	58000	580
DETSC 2130 Phenol Index	< 100	< 1
DETSC 2085 Dissolved Organic Carbon	2800	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	7.8
DETSC 2009 Conductivity uS/cm	82.7
* Temperature*	16.0

Mass of Sample Kg*	0.110
Mass of dry Sample Kg*	0.094

Stage 1

Volume of Leachant L2*	0.923
Volume of Eluate VE1*	0.879

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 22-26987
Client Ref UK22.6230
Contract Title Hayling Island
Sample Id WS04 ES1 0.70-1.00

Sample Numbers 2104226 2104228
Date Analysed 09/01/2023

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	0.6
DETSC 2003# Loss On Ignition	%	3.2
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# EPH (C10 - C40): EH_1D_Total	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate		
Determinand and Method Reference	Conc in Eluate ug/l	Amount Leached* mg/kg
	10:1	LS10
DETSC 2306 Arsenic as As	0.28	< 0.01
DETSC 2306 Barium as Ba	8	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.02
DETSC 2306 Chromium as Cr	0.26	< 0.1
DETSC 2306 Copper as Cu	0.89	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.1
DETSC 2306 Lead as Pb	0.34	< 0.05
DETSC 2306 Antimony as Sb	0.41	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 0.01
DETSC 2055 Chloride as Cl	3200	< 100
DETSC 2055* Fluoride as F	< 100	< 0.1
DETSC 2055 Sulphate as SO4	6400	< 100
DETSC 2009* Total Dissolved Solids	71000	710
DETSC 2130 Phenol Index	< 100	< 1
DETSC 2085 Dissolved Organic Carbon	2700	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	7.6
DETSC 2009 Conductivity uS/cm	102.0
* Temperature*	15.0

Mass of Sample Kg*	0.120
Mass of dry Sample Kg*	0.102

Stage 1

Volume of Leachant L2*	0.997
Volume of Eluate VE1*	0.95

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2104219	WS01 ES1 0.40-0.80	SOIL	NAD	none	Josh Best
2104220	WS01 ES3 4.50-5.00	SOIL	NAD	none	Josh Best
2104221	WS02 ES1 0.00-0.20	SOIL	NAD	none	Josh Best
2104222	WS02 ES2 0.60-1.00	SOIL	NAD	none	Josh Best
2104226	WS04 ES1 0.70-1.00	SOIL	NAD	none	Josh Best

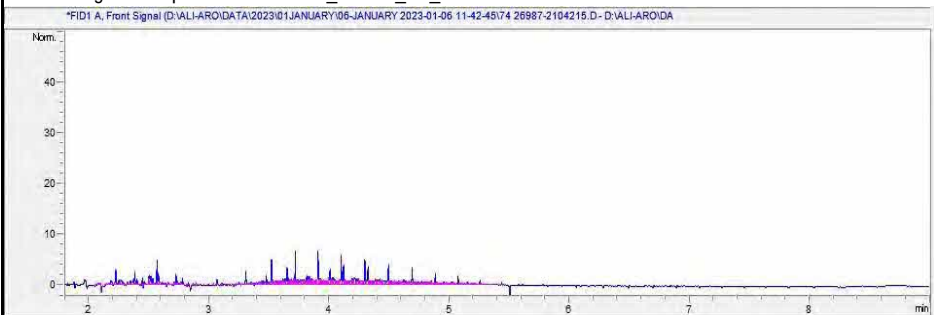
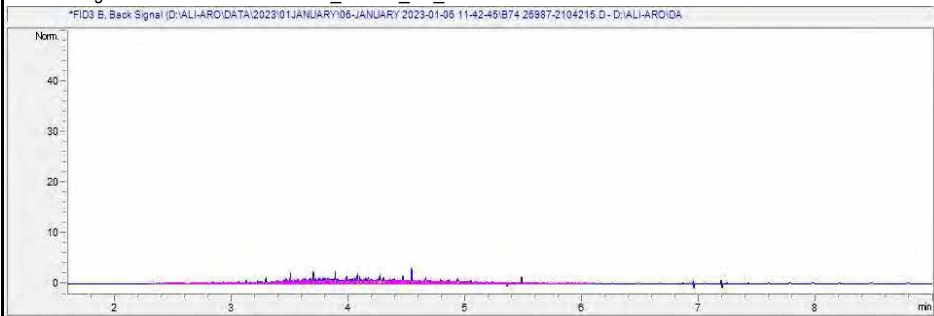
Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Summary of Chemical Analysis

Chromatograms

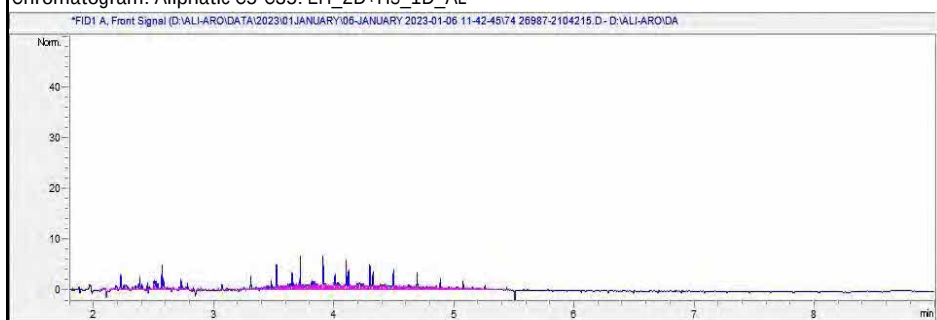
Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104215
Sample ID	WS01 GW1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	21/12/2022
Sampling Time	

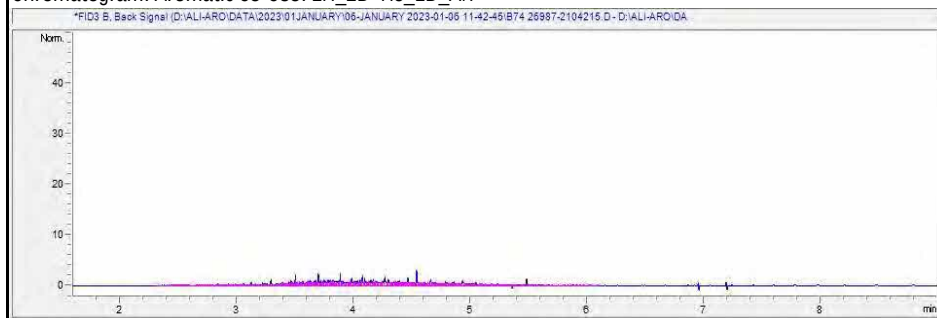
Test	Method	LOD	Units
Petroleum Hydrocarbons			
Chromatogram: Aliphatic C5-C35: EH_2D+HS_1D_AL *			
			
Chromatogram: Aromatic C5-C35: EH_2D+HS_1D_AR *			
			

Petroleum Hydrocarbons

Chromatogram: Aliphatic C5-C35: EH_2D+HS_1D_AL *



Chromatogram: Aromatic C5-C35: EH_2D+HS_1D_AR *



Summary of Chemical Analysis

Chromatograms

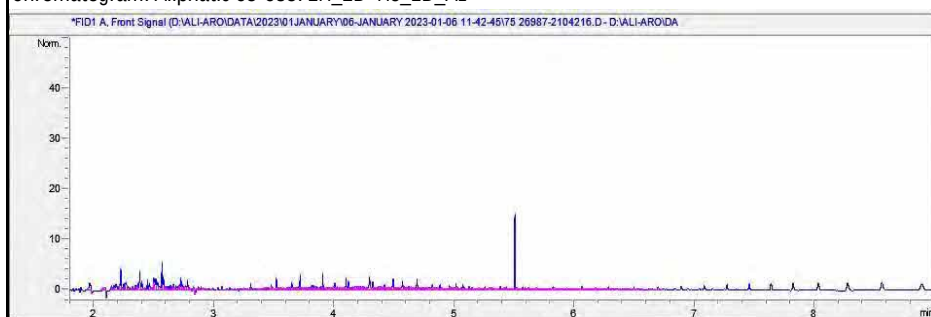
Our Ref 22-26987
Client Ref UK22.6230
Contract Title Hayling Island

Lab No	2104216
Sample ID	WS02 GW1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	21/12/2022
Sampling Time	

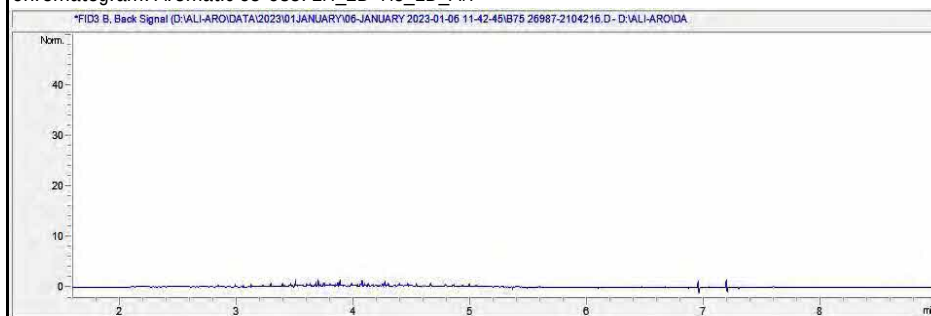
Test	Method	LOD	Units
------	--------	-----	-------

Petroleum Hydrocarbons

Chromatogram: Aliphatic C5-C35: EH_2D+HS_1D_AL *



Chromatogram: Aromatic C5-C35: EH_2D+HS_1D_AR *

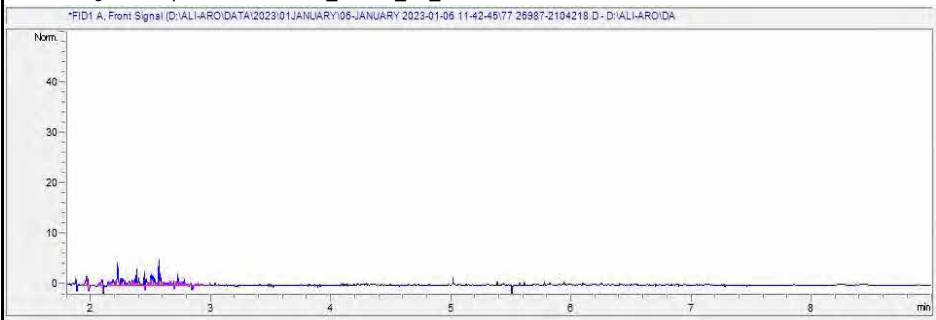
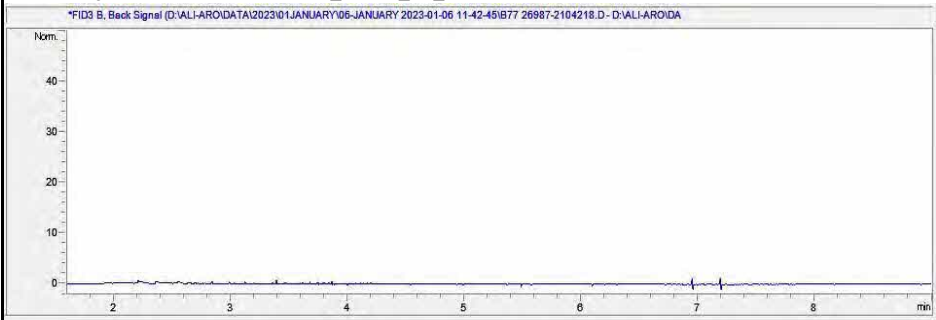


Summary of Chemical Analysis

Chromatograms

Our Ref 22-26987
 Client Ref UK22.6230
 Contract Title Hayling Island

Lab No	2104218
Sample ID	WS04 GW1
Depth	
Other ID	
Sample Type	WATER
Sampling Date	21/12/2022
Sampling Time	

Test	Method	LOD	Units
Petroleum Hydrocarbons			
Chromatogram: Aliphatic C5-C35: EH_2D+HS_1D_AL *			
			
Chromatogram: Aromatic C5-C35: EH_2D+HS_1D_AR *			
			

Information in Support of the Analytical Results

Our Ref 22-26987
Client Ref UK22.6230
Contract Hayling Island

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2104215	WS01 GW1 WATER	21/12/22	GB 1L, GV x2		
2104216	WS02 GW1 WATER	21/12/22	GB 1L, GV x2		
2104217	WS03 GW1 WATER	21/12/22	GB 1L, GV x2		
2104218	WS04 GW1 WATER	21/12/22	GB 1L, GV x2		
2104219	WS01 ES1 0.40-0.80 SOIL	21/12/22	GJ 250ml, GJ 60ml, PG		
2104220	WS01 ES3 4.50-5.00 SOIL	21/12/22	GJ 250ml, GJ 60ml, PG		
2104221	WS02 ES1 0.00-0.20 SOIL	21/12/22	GJ 250ml, GJ 60ml, PG x2		
2104222	WS02 ES2 0.60-1.00 SOIL	21/12/22	GJ 250ml, GJ 60ml		
2104223	WS02 ES3 2.50-3.00 SOIL	21/12/22	GJ 250ml, GJ 60ml, PG		
2104224	WS03 ES2 2.50-2.80 SOIL	21/12/22	GJ 250ml, GJ 60ml, PG		
2104225	WS03 ES3 4.50-4.80 SOIL	21/12/22	GJ 250ml, GJ 60ml, PG		
2104226	WS04 ES1 0.70-1.00 SOIL	21/12/22	GJ 250ml, GJ 60ml		
2104227	WS01 ES1 0.40-0.80 LEACHATE	21/12/22	GJ 250ml, GJ 60ml, PG		
2104228	WS04 ES1 0.70-1.00 LEACHATE	21/12/22	GJ 250ml, GJ 60ml		

Key: G-Glass B-Bottle V-Vial P-Plastic J-Jar G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL
Aliphatic C6-C8	HS_1D_AL
Aliphatic C8-C10	HS_1D_AL
Aliphatic >EC10-EC12	EH_2D_AL
Aliphatic >EC12-EC16	EH_2D_AL
Aliphatic >EC16-EC21	EH_2D_AL
Aliphatic >EC21-EC35	EH_2D_AL
Aliphatic C5-C35	EH_2D+HS_1D_AL
Aromatic C5-C7	HS_1D_AR
Aromatic C7-C8	HS_1D_AR
Aromatic C8-C10	HS_1D_AR
Aromatic >EC10-EC12	EH_2D_AR
Aromatic >EC12-EC16	EH_2D_AR
Aromatic >EC16-EC21	EH_2D_AR
Aromatic >EC21-EC35	EH_2D_AR
Aromatic C5-C35	EH_2D+HS_1D_AR
TPH Ali/Aro Total C5-C35	EH_2D+HS_1D_Total
TPH (C10-C40)	EH_1D_Total
Aliphatic C10-C12	EH_CU_1D_AL
Aliphatic C12-C16	EH_CU_1D_AL
Aliphatic C16-C21	EH_CU_1D_AL
Aliphatic C21-C35	EH_CU_1D_AL
Aliphatic C5-C35	EH_CU+HS_1D_AL
Aromatic C10-C12	EH_CU_1D_AR
Aromatic C12-C16	EH_CU_1D_AR
Aromatic C16-C21	EH_CU_1D_AR



Aromatic C21-C35
Aromatic C5-C35
TPH Ali/Aro Total C5-C35

EH_CU_1D_AR
EH_CU+HS_1D_AR
EH_CU+HS_1D_Total

End of Report

APPENDIX J

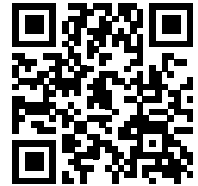
Waste Classification Report



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



5VWD7-BZQDV-FXNAF

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

UK22.6230 Hayling Island

Description/Comments

Project

UK22.6230

Site

Hayling Island

Classified by

Name: **Lee Anderson**
Date: **11 Jan 2023 10:27 GMT**
Telephone: **0113 8730211**

Company: **Environmental Strategies Ltd EPS**
10-12 East Parade
Leeds
LS1 2BH

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

03 Dec 2020

Next 3 year Refresher due by Dec 2023

Purpose of classification

2 - Material Characterisation

Address of the waste

Hayling Island

Post Code N/A

SIC for the process giving rise to the waste

41201 Construction of commercial buildings

Description of industry/producer giving rise to the waste

Redevelopment of current petrol filling station

Description of the specific process, sub-process and/or activity that created the waste

Waste created during redevelopment works including formation of foundations

Description of the waste

Soils beneath site



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01 ES1/0.40-0.80/2022-12-21	0.4-0.8	Non Hazardous		3
2	WS01 ES3/4.50-5.00/2022-12-21	4.5-5.0	Non Hazardous		5
3	WS02 ES1/0.00-0.20/2022-12-21	0.0-0.2	Non Hazardous		8
4	WS02 ES2/0.60-1.00/2022-12-21	0.6-1.0	Non Hazardous		11
5	WS04 ES1/0.70-1.00/2022-12-21	0.7-1.0	Non Hazardous		14

Related documents

#	Name	Description
1	22-26987.hwol	DETS North .hwol file used to populate the Job
2	DETS North	waste stream template used to create this Job

Report

Created by: Lee Anderson

Created date: 11 Jan 2023 10:27 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	16
Appendix B: Rationale for selection of metal species	17
Appendix C: Version	18



Classification of sample: WS01 ES1/0.40-0.80/2022-12-21

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS01 ES1/0.40-0.80/2022-12-21** LoW Code: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Sample Depth: **0.4-0.8 m** Chapter: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**
Moisture content: **15%**
(wet weight correction)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	 arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	4.3 mg/kg	1.32	4.826 mg/kg	0.000483 %	✓	
2	 chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		9.8 mg/kg	1.462	12.175 mg/kg	0.00122 %	✓	
3	 chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8			<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
4	 copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	7.6 mg/kg	1.126	7.273 mg/kg	0.000727 %	✓	
5	 lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	5.7 mg/kg	1.56	7.557 mg/kg	0.000484 %	✓	
6	 mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.0000677 %		<LOD
7	 nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	8.7 mg/kg	2.976	22.009 mg/kg	0.0022 %	✓	
8	 selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
9	 zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	26 mg/kg	2.774	61.309 mg/kg	0.00613 %	✓	
10	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
11	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
12	acenaphthylene		205-917-1	208-96-8	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
13	acenaphthene		201-469-6	83-32-9	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
14	fluorene		201-695-5	86-73-7	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
15	phenanthrene		201-581-5	85-01-8	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	anthracene	204-371-1	120-12-7		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
17	fluoranthene	205-912-4	206-44-0		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	pyrene	204-927-3	129-00-0		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
19	benzo[a]anthracene	601-033-00-9	200-280-6		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
20	chrysene	601-048-00-0	205-923-4		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
21	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
23	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
24	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
26	benzo[ghi]perylene	205-883-8	191-24-2		<0.03 mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	cadmium (non-pyrophoric); [1] cadmium oxide (non-pyrophoric) [2]	048-002-00-0	231-152-8 [1] 215-146-2 [2]		0.4 mg/kg		0.34	mg/kg	0.000034 %	✓	
Total:									0.0127 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification



Classification of sample: WS01 ES3/4.50-5.00/2022-12-21

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS01 ES3/4.50-5.00/2022-12-21** LoW Code: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Sample Depth: **4.5-5.0 m** Chapter: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	0.7	mg/kg	1.32	0.924	mg/kg	0.0000924 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2								
3	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	2.4	mg/kg	1.126	2.702	mg/kg	0.00027 %	✓	
4	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6								
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.0000677 %		<LOD
6	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7								
7	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	0.7	mg/kg	2.554	1.788	mg/kg	0.000179 %	✓	
8	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9								
9	pH			PH	8.5	pH		8.5	pH	8.5 pH		
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5										
11	TPH (C6 to C40) petroleum group			TPH	<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
12	benzene	601-020-00-8	200-753-7	71-43-2								
13	toluene	601-021-00-3	203-625-9	108-88-3	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
14	ethylbenzene	601-023-00-4	202-849-4	100-41-4								
15	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							
18	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9							
19	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7							
20	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-581-5	85-01-8							
21	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-371-1	120-12-7							
22	fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-912-4	206-44-0							
23	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-927-3	129-00-0							
24	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-883-8	191-24-2							
32	cadmium (non-pyrophoric); [1] cadmium oxide (non-pyrophoric) [2]				0.5 mg/kg		0.5 mg/kg	0.00005 %	✓	
	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]							
33	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
34	chromium { chromium(VI) oxide }				1.3 mg/kg	1.923	2.5 mg/kg	0.00025 %	✓	
	024-001-00-0	215-607-8	1333-82-0							
Total:								0.00611 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"

Force this Hazardous property to non hazardous because Assuming 100% of chromium detected is hexavalent and available. Further testing showed that >1.0mg/kg is hexavalent



Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00025%)



Classification of sample: WS02 ES1/0.00-0.20/2022-12-21



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS02 ES1/0.00-0.20/2022-12-21** LoW Code: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Sample Depth: **0.0-0.2 m** Chapter: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				11	mg/kg	1.32	14.524	mg/kg	0.00145 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.8	mg/kg	3.22	2.576	mg/kg	0.000258 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
3	copper { dicopper oxide; copper (I) oxide }				27	mg/kg	1.126	30.399	mg/kg	0.00304 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
4	lead { lead chromate }			1	58	mg/kg	1.56	90.469	mg/kg	0.0058 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
5	mercury { mercury dichloride }				0.05	mg/kg	1.353	0.0677	mg/kg	0.00000677 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
6	nickel { nickel chromate }				15	mg/kg	2.976	44.644	mg/kg	0.00446 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
7	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
8	zinc { zinc chromate }				79	mg/kg	2.774	219.158	mg/kg	0.0219 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
9	pH		PH		7.9	pH		7.9	pH	7.9 pH		
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %	✓	
	006-007-00-5											
11	TPH (C6 to C40) petroleum group		TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
12	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
13	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
14	ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
15	xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
17	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
18	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
19	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
20	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-581-5	85-01-8								
21	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-371-1	120-12-7								
22	fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-912-4	206-44-0								
23	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-927-3	129-00-0								
24	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
25	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
26	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
27	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
28	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
29	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
30	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
31	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
32	cadmium (non-pyrophoric); [1] cadmium oxide (non-pyrophoric) [2]				0.5 mg/kg		0.5 mg/kg	0.00005 %		✓	
	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]								
33	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %			<LOD
			P1186								
34	chromium { chromium(VI) oxide }				17 mg/kg	1.923	32.693 mg/kg	0.00327 %		✓	
	024-001-00-0	215-607-8	1333-82-0								
Total:									0.0416 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- This determinand is defined in the EU CLP Table 3
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"

Force this Hazardous property to non hazardous because Assuming 100% of chromium detected is hexavalent and available. Further testing showed that >1.0mg/kg is hexavalent



Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00327%)



Classification of sample: WS02 ES2/0.60-1.00/2022-12-21

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS02 ES2/0.60-1.00/2022-12-21** LoW Code: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Sample Depth: **0.6-1.0 m** Chapter: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	8.5	mg/kg	1.32	11.223	mg/kg	0.00112 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2								
3	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1								
4	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	44	mg/kg	1.56	68.632	mg/kg	0.0044 %	✓	
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7								
6	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7								
7	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
8	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9								
9	pH			PH								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %	✓	
11	TPH (C6 to C40) petroleum group			TPH								
12	benzene	601-020-00-8	200-753-7	71-43-2								
13	toluene	601-021-00-3	203-625-9	108-88-3	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
14	ethylbenzene	601-023-00-4	202-849-4	100-41-4								
15	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							
18	acenaphthene				0.2 mg/kg		0.2 mg/kg	0.00002 %	✓	
		201-469-6	83-32-9							
19	fluorene				0.3 mg/kg		0.3 mg/kg	0.00003 %	✓	
		201-695-5	86-73-7							
20	phenanthrene				0.5 mg/kg		0.5 mg/kg	0.00005 %	✓	
		201-581-5	85-01-8							
21	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-371-1	120-12-7							
22	fluoranthene				0.6 mg/kg		0.6 mg/kg	0.00006 %	✓	
		205-912-4	206-44-0							
23	pyrene				0.5 mg/kg		0.5 mg/kg	0.00005 %	✓	
		204-927-3	129-00-0							
24	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-883-8	191-24-2							
32	cadmium (non-pyrophoric); [1] cadmium oxide (non-pyrophoric) [2]				0.4 mg/kg		0.4 mg/kg	0.00004 %	✓	
	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]							
33	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
34	chromium { chromium(VI) oxide }				17 mg/kg	1.923	32.693 mg/kg	0.00327 %	✓	
	024-001-00-0	215-607-8	1333-82-0							
Total:								0.0356 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"

Force this Hazardous property to non hazardous because Assuming 100% of chromium detected is hexavalent and available. Further testing showed that >1.0mg/kg is hexavalent



Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00327%)



Classification of sample: WS04 ES1/0.70-1.00/2022-12-21



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS04 ES1/0.70-1.00/2022-12-21	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.7-1.0 m	
Moisture content:	
15%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	9.5 mg/kg	1.32	10.662 mg/kg	0.00107 %	✓	
2	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		21 mg/kg	1.462	26.089 mg/kg	0.00261 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8			<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	14 mg/kg	1.126	13.398 mg/kg	0.00134 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	27 mg/kg	1.56	35.798 mg/kg	0.00229 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	17 mg/kg	2.976	43.007 mg/kg	0.0043 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	53 mg/kg	2.774	124.975 mg/kg	0.0125 %	✓	
10	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
11	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
12	acenaphthylene	205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
13	acenaphthene	201-469-6	83-32-9		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
14	fluorene	201-695-5	86-73-7		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
15	phenanthrene	201-581-5	85-01-8		0.06 mg/kg		0.051 mg/kg	0.0000051 %	✓	



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	anthracene	204-371-1	120-12-7		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
17	fluoranthene	205-912-4	206-44-0		0.21 mg/kg		0.179 mg/kg	0.0000179 %	✓	
18	pyrene	204-927-3	129-00-0		0.19 mg/kg		0.161 mg/kg	0.0000161 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6		0.07 mg/kg		0.0595 mg/kg	0.00000595 %	✓	
20	chrysene	601-048-00-0	205-923-4		0.11 mg/kg		0.0935 mg/kg	0.00000935 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.1 mg/kg		0.085 mg/kg	0.0000085 %	✓	
22	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.04 mg/kg		0.034 mg/kg	0.0000034 %	✓	
23	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.08 mg/kg		0.068 mg/kg	0.0000068 %	✓	
24	indeno[123-cd]pyrene	205-893-2	193-39-5		0.05 mg/kg		0.0425 mg/kg	0.00000425 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	benzo[ghi]perylene	205-883-8	191-24-2		0.05 mg/kg		0.0425 mg/kg	0.00000425 %	✓	
27	cadmium (non-pyrophoric); [1] cadmium oxide (non-pyrophoric) [2]	048-002-00-0	231-152-8 [1] 215-146-2 [2]		0.2 mg/kg		0.17 mg/kg	0.000017 %	✓	
Total:								0.0256 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

• **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

• **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

• **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

• **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

• **chromium(VI) oxide** (EC Number: 215-607-8, CAS Number: 1333-82-0)

EU CLP index number: 024-001-00-0
Description/Comments:
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Hazard Statements: Ox. Sol. 1; H271 , Carc. 1A; H350 , Muta. 1B; H340 , Repr. 2; H361f , Acute Tox. 2; H330 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 1; H372 , Skin Corr. 1A; H314 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , STOT SE 3; H335 >= 1 %

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)



nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

chromium {chromium(VI) oxide}

Worst case

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2023.10.5480.10158 (10 Jan 2023)
HazWasteOnline Database: 2023.10.5480.10158 (10 Jan 2023)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1stEditionv1.2.GB-Oct2021

CLP Regulation - Regulation1272/2008/ECof16December2008

1st ATP - Regulation790/2009/ECof10August2009

2nd ATP - Regulation286/2011/ECof10March2011

3rd ATP - Regulation618/2012/EUof10July2012

4th ATP - Regulation487/2013/EUof8May2013

Correction to 1st ATP - Regulation758/2013/EUof7August2013

5th ATP - Regulation944/2013/EUof2October2013

6th ATP - Regulation605/2014/EUof5June2014

WFD Annex III replacement - Regulation1357/2014/EUof18December2014

Revised List of Waste 2014 - Decision2014/955/EUof18December2014

7th ATP - Regulation2015/1221/EUof24July2015

8th ATP - Regulation(EU)2016/918of19May2016

9th ATP - Regulation(EU)2016/1179of19July2016

10th ATP - Regulation(EU)2017/776of4May2017

HP14 amendment - Regulation(EU)2017/997of8June2017

13th ATP - Regulation(EU)2018/1480of4October2018

14th ATP - Regulation(EU)2020/217of4October2019

15th ATP - Regulation(EU)2020/1182of19May2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK:2020No.1567of16thDecember2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version1.1of09June2021

APPENDIX K

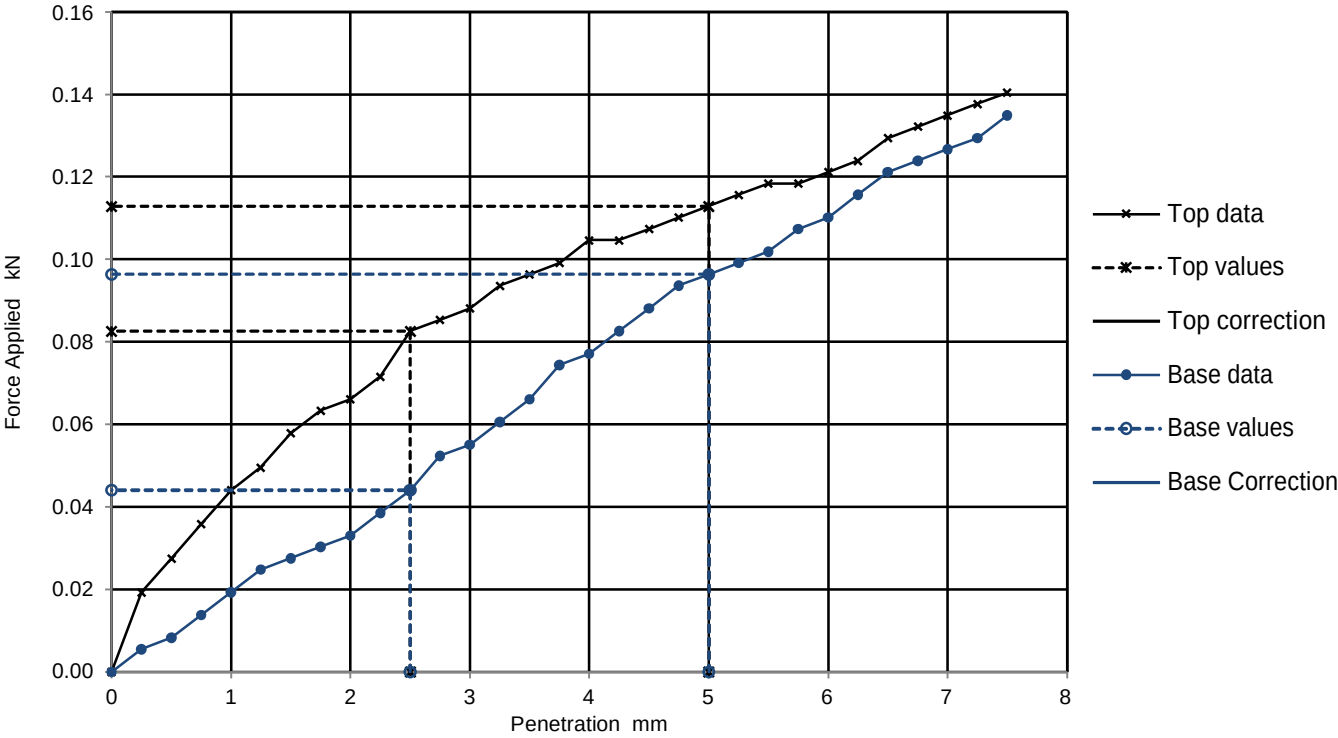
Laboratory Results –Geotechnical

GQF-008-36 Issue 01 - Oct 22	California Bearing Ratio (CBR)			Job Ref	J222626
				Borehole/Pit No.	WS02
Project Name	Hayling Island			Sample No.	1
Soil Description	Light brown slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description				KeyLAB ID	TTLP2023010951
Test Method	BS1377 : Part 4 : 1990, clause 7			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details		Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days	
				Time to surface		days	
				Amount of swell recorded		mm	
Material retained on 20mm sieve removed			0	%	Dry density after soaking		Mg/m ³
Initial Specimen details	Bulk density	2.01	Mg/m ³	Surcharge applied		15	kg
	Dry density	1.64	Mg/m ³			9	kPa
	Moisture content	22.4	%				

Force v Penetration Plots



Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	0.63	0.56	0.63	N/A
No	0.33	0.48	0.48	

Moisture Content	%
	22.1
	22.5

Remarks



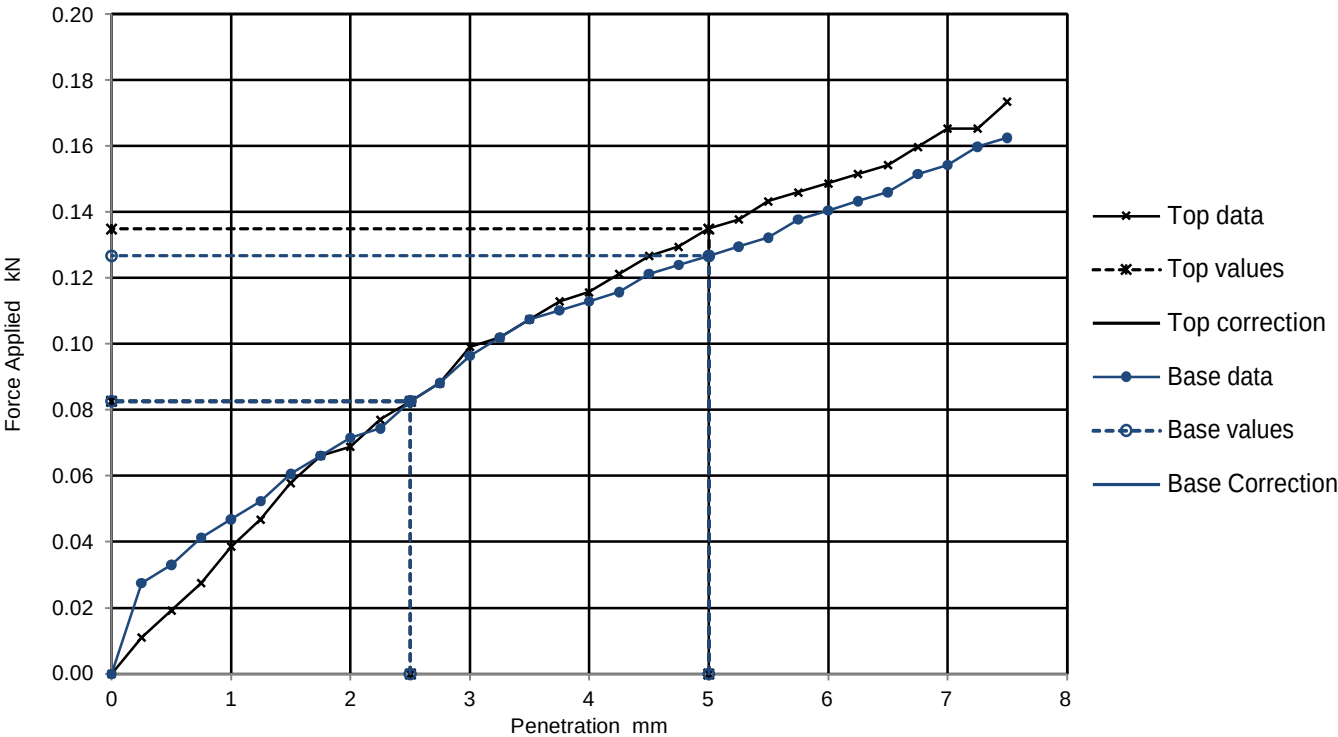
CBR

GQF-008-36 Issue 01 - Oct 22	California Bearing Ratio (CBR)			Job Ref	J222626
				Borehole/Pit No.	WS04
Project Name	Hayling Island			Sample No.	1
Soil Description	Light brown slightly sandy slightly gravelly CLAY. Gravel contains chalk.			Depth m	1.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description				KeyLAB ID	TTLP202301056
Test Method	BS1377 : Part 4 : 1990, clause 7			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED		Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer		Period of soaking	days	
			Time to surface	days	
			Amount of swell recorded	mm	
Material retained on 20mm sieve removed	11	%	Dry density after soaking	Mg/m ³	
Initial Specimen details	Bulk density	2.04	Mg/m ³	Surcharge applied	15 kg
	Dry density	1.70	Mg/m ³		9 kPa
	Moisture content	20.0	%		

Force v Penetration Plots



Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	0.63	0.67	0.67	0.65
No	0.63	0.63	0.63	

Moisture Content	%
	21.4
	21.8

Remarks



CBR

APPENDIX L

Generic Screening Criteria



EPS Generic Quantitative Risk Assessment

Generic Screening Criteria (C4SLs) - All Land Uses

	Soil Targets					
Contaminant	Residential		Allotments	Commercial	Public Open Spaces	
	With Home Grown Produce	Without Home Grown Produce			Residential	Parks
Unit	mg/kg					
Arsenic	37	40	49	640	79	168
Benzene	0.87	3.3	0.18	98	140	230
Benzo(a)pyrene	5	5.3	5.7	76	10	21
Cadmium	26	149	4.9	410	220	880
Chromium (VI)	21	21	170	49	23	250
Lead	200	310	80	2330	630	1300
Chloroethene (Vinyl Chloride)	0.017	0.029	0.0058	2.2	7.8	19
Trichloroethene (TCE)	0.043	0.045	0.16	3.4	79	69
Tetrachloroethene (PCE)	1.6	1.6	11	130	3400	2500

Notes:

Targets for Human Health have been taken from the publicly available Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination issued by DEFRA/CL:AIRE in December 2013 and May 2021.

Within the modelling for C4SLs, a Soil Organic Matter content of 6% has been used. Reference to site-specific data should be made where possible.

The C4SLs for the contaminant benzene along with the three chlorinated solvents are the most susceptible to changes in SOM.

May-22

EPS Generic Quantitative Risk Assessment - Commercial Landuse

Contaminant	Soil Targets		
	Human Health	Controlled Waters	
		Surface Water	Groundwater
Unit	mg/kg		
Arsenic	See C4SL	n/c	n/c
Cadmium	See C4SL	n/c	n/c
Chromium III	8600	n/c	n/c
Chromium VI	See C4SL	n/c	n/c
Copper	68000	n/c	n/c
Mercury (elemental)	58	0.085	1.22
Nickel	980	n/c	n/c
Lead	See C4SL	n/c	n/c
Selenium	12000	n/c	n/c
Zinc	730000	n/c	n/c
Benzene	See C4SL	0.064	0.0064
Toluene	56000* (869)	1.33	12.6
Ethylbenzene	5700* (518)	0.77	11.5
Xylene (Para)	5900** (576)	1.18	19.6
MTBE#	7900	4.41	0.026
Benzo(a)Pyrene	see C4SL	n/c	n/c
Naphthalene	190** (76.4)	0.11	0.11
Aliphatic C5-C6	3200** (304)	4.06	0.81
Aliphatic C6-C8	7800** (144)	17.8	3.57
Aliphatic C8-C10	2000** (78)	n/c	n/c
Aliphatic C10-C12	9700** (48)	n/c	n/c
Aliphatic C12-C16	59000** (24)	n/c	n/c
Aliphatic C16-C35	1600000	n/c	n/c
Aromatic C8-C10	3500* (613)	6.71	1.34
Aromatic C10-C12	16000** (364)	10.6	2.13
Aromatic C12-C16	36000** (169)	21.2	4.23
Aromatic C16-C21	28000	n/c	n/c
Aromatic C21-C35	28000	n/c	n/c
Tetrachloroethene	See C4SL	0.24	0.24
Trichloroethene	See C4SL	0.13	0.13
cis-1,2 Dichloroethene		0.21	0.21
Vinyl Chloride	See C4SL	0.0012	0.0012

Groundwater Targets		
Human Health	Controlled Waters	
	Surface Water	Groundwater
µg/l		
n/c	50	10
n/c	2.5#	5
n/c	4.7	50
n/c	3.4	
n/c	93.1#	2000
95 (sol)	1	1
n/c	14.8#	20
n/c	27.7#	10
n/c	10	10
n/c	373#	3000
20,000	10	1
21,000,000 (sol)	74	700
960,000 (sol)	20	300
980,000 (sol)	30	500
7,800,000	2600	15
n/c	0.005 (0.00017)	0.01
23,000 (sol)	2	2
190,000 (sol)	50	10
150,000 (sol)	50	10
5,700 (sol)	50	10
3,600 (sol)	50	10
n/c	50	10
n/c	50	10
190,000 (sol)	50	10
660,000 (sol)	50	10
3,700,000 (sol)	50	10
n/c	50	10
n/c	50	10
4,600	10	10
530	10	10
13,000	50	50
63	0.5	0.5

Notes:

f = Oral, dermal and inhalation exposure compared with oral HCV N/C = Not Calculated

* = S4UL exceeds vapour saturation limit (in brackets) ** = S4UL exceeds solubility saturation limit (in brackets)

Human Health Groundwater GAC with (sol) exceed aqueous solubility

n/c = not calculated. Under normal conditions contaminant exhibits low solubility /volatility, therefore risks from leaching and or vapour pathways are considered low.

To establish suitable compliance criteria for Surface Water review of baseline groundwater quality in England and Wales was completed following research reported in Shand, P, Edmunds, W M, Lawrence, A R, Smedley, P L, and Burke, S. 2007. The natural (baseline) quality of groundwater in England and Wales. British Geological Survey Research Report No. RR/07/06. Where compliance criteria was found below the 97.7 percentile of baseline value, the latter was adopted as GAC.

Soil Targets

Targets for Human Health have been taken from S4ULs 'Suitable For Use Levels for Human Health Risk Assessment' – LQM and CIEH (2014) derived using standard sandy loam soil with 1% SOM, except (#) = EIC/AGS/CL/AIRE GAC 'Soil Generic Assessment Criteria' (2010). For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the generic human health targets may be revised.

Targets for Controlled waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for Surface Water and Groundwater respectively (see notes for GW targets).

Groundwater Targets

For Surface Water, targets have been taken as Freshwater EQS where available. For MTBE Predicted No Effect Concentration (European Risk Assessment Report, 2002) was used. For individual TPH fractions, in absence of UK EQS, a 5 times multiplier of UKDWS has been taken.

For Groundwater, targets have been taken as UKDWS where available. In the absence of UK targets internationally recognised criteria were adopted. For MTBE, WHO taste threshold has been adopted.

Targets for Human Health have been taken from Society of Brownfield Risk Assessment (SoBRA) 'Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater' - Version 1.0, February 2017, derived using sandy soil and 1%SOM. GAC were set up assuming source at 50cm below typical ground bearing slab of 15cm thickness. GAC were derived for vapour pathways only. For sites where ground conditions, or differ significantly from described above, the generic human health targets may be revised.

APPENDIX M

Method Statement for Encountering Unexpected Contamination



METHOD STATEMENT

ACTIONS TO BE TAKEN IN THE EVENT OF DISCOVERING UNEXPECTED CONTAMINATION DURING INTRUSIVE GROUNDWORKS

If at any point during intrusive groundworks at a site, evidence of unforeseen contamination is encountered in the form of significant noxious odours, discolouration, or instability within soils or sheen/ discolouration in groundwater, the following actions will be taken:

Intrusive works in the immediate area of the impacted ground will be suspended and the continuation of work in other areas of the site will be considered within the context of the site specific health & safety plan.

Environmental Protection Strategies Ltd (EPS) will be contacted and appraised of the situation so that arrangements can be made to characterise the impact and determine what action may be necessary in addition to the scheduled site works. Where possible / health & safety plan permits, digital photographs of the impacted ground will be taken and emailed to EPS at the address below to assist in the initial assessment

It may well be necessary for EPS to attend site to undertake visual inspection and obtain samples for field and/or laboratory analysis, although the actions taken will be dependent on the nature of what is encountered

In cases where EPS consider the unforeseen contamination likely to pose a significant risk of significant harm to adjacent site users or local environmental receptors, the local authority and the Environment Agency will be informed of the situation and the actions being taken

Once appropriate action has been agreed and undertaken, a written summary will be produced by EPS for submission to the Local Authority, (and where relevant, the Environment Agency) in accordance with planning requirements. The submission will include details of work undertaken, analytical results of investigative and validation samples obtained and conclusions and recommendations for any further actions considered necessary

Where regulatory bodies have been involved, site works should only recommence following their agreement and in all cases should only recommence when the site manager considers it safe to do so within the context of the site specific health & safety plan.

EPS Contact Details:

Marcus Bell	Associate Director	Tel: 078 7 206 9979
Will Evans	Director	Tel: 0781 253 9655
Steve Bullock	Director	Tel: 0786 694 9221

Email: info@epstrategies.co.uk (Automatically forwarded to the above and office-based personnel)



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